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CATALOGUE

OF THE

AFRICAN PLANTS

COLLECTED BY

DR. FRIEDRICH WELWITSCH
IN 1853-61.

Vol. I

DICOTYLEDONS, PART III.

DIPSACEÆ to SCROPHULARIACEÆ.

BY

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LONDON:
PRINTED BY ORDER OF THE TRUSTEES.

SOLD BY
LONGMANS & CO., 39 PATERNOSTER ROW;
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AND AT THE
BRITISH MUSEUM (NATURAL HISTORY), CROMWELL ROAD, S.W.

1898.

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Printed by Hazell, Watson, & Viney, Ld., London and Aylesbury.

The following species should have appeared, *ante*, p. 480, after *Canthium platyphyllum* :—

16. **Canthium lactescens** Hiern, sp. nov.

A very densely branched tree, 15 to 25 ft. high ; trunk 1 to 1½ ft. in diameter, bifurcately branched a little above the base ; branchlets rather thick, dusky-ashy, nodose, glabrous, patent ; leaves opposite, broadly ovate or irregularly rotund, more or less pointed or minutely apiculate or rounded at the apex, rounded or obtuse to or near the base, membranous, somewhat glaucescent, glabrous above, rather paler and glabrous except the tufts of hairs in the axils of the (about 8) pairs of lateral veins beneath, 1½ to 2¼ in. long by 1 to 1⅝ in. broad ; petiole ¼ to ½ in. long, glabrous or very nearly so ; stipules interpetiolar, broadly deltoid, minutely apiculate, copiously lactescent, deciduous ; flowers pentamerous, pale yellowish, in colour and also almost in scent like elder, numerous, about ⅛ in. long and across, on shorter pedicels, arranged in much branched puberulous axillary and sub-terminal pedunculate panicles of 1 to 1½ in. in diameter ; peduncles ¼ to ½ in. long, puberulous ; calyx-limb very small, with very short teeth ; the tube very easily separable from the ovary, glabrous or very nearly so ; corolla superior, glabrous or very nearly so outside ; the tube short, somewhat funnel-shaped, shaggy inside and at the throat ; the lobes ovate, pointed at the apex, valvate in the bud, longer than the tube, spreading or recurved in flower ; anthers inserted about the sinuses between the corolla-lobes on very short filaments, exserted, glabrous, ovate-oblong, obtuse ; style glabrous, solitary ; stigma subglobose, slightly calyptriform and compressed, shortly exserted beyond the open corolla but falling rather short of the anther-tips, glabrous, 10-ribbed, 5 of the ribs opposite to the anthers and the other 5 opposite to the corolla-lobes ; all these organs pale yellowish ; ovary 2-celled, cells uniovulate, ovules pendulous.

Huilla.—In forests near Lopollo, towards the east, in company with Nocha (*Parinari Mobola* ; Welw. herb. no. 1282) and *Gigalobium abyssinicum* (Welw. herb. no. 1782) ; fl. end of Dec. 1859. No. **3157**.

This is nearly related to *C. crassum* and *C. umbrosum*.

LXX. DIPSACEÆ.

This family is represented by only two species, occurring on the table-lands of Huilla, which in the Linnean sense belong to the genus *Scabiosa* ; one of them in October soon after the first spring rains clothes the meadows and pastures of Humpata and Mumpulla with its whitish violet-tinted flower-heads ; the form of it found above Mumpulla had violet-coloured flowers passing into bluish, which when dried became quite white and subsequently yellowish-white. The other species has white flowers appearing very abundantly in the humid forest-meadows of

Lopollo in January and February, and in combination with *Clematis villosa* produces the effect of pastures covered with snow.

1. **CEPHALARIA** Schrad. ; Benth. & Hook. f. Gen. Pl. ii. p. 159.

1. **C. centauroides** Roem. & Schult. Syst. Veg. iii. p. 49 (1818); Hiern in Oliv. Fl. Trop. Afr. iii. p. 251.

Huilla.—A perennial herb, 3 to 5 ft. high ; stem ascending or erect, fistular, hexagonal ; leaves opposite, remarkably polymorphous, the lowest ones undivided, the middle ones pinnatifid, the highest ones linear with 1 or 2 teeth at the base on each side or lanceolate and not toothed ; the white-flowered heads terminal, globose-hemispherical, not depressed, on very long peduncles ; leaves of the involucre numerous, rounded-obtuse at the apex, rather rugose on the back, densely ciliolate on the margin ; paleæ of the receptacle elongate-obovate, concave, abruptly acuminate at the apex, half-embracing the involucel which is tetragonal densely hirsute furrowed on the inner face and crowned with 4 large more or less purpurascent teeth ; calyx-(which perhaps might be regarded as a metamorphosis of the disk) -tube adnate to the ovary, constricted below the circular patelliform limb, crenulate on the margin with several erect more or less purpurascent teeth, densely shaggy inside ; corolla white, tubular, the limb 4-cleft with obovate-spathulate subequal spreading segments shaggy outside with white hairs, the tube white-hairy on both sides ; stamens 4, 1 to 3 of them sterile, white, far exserted ; ovary inferior (or superior, if the involucel is considered to be a calyx and the calyx a modified disk), 1-celled, 1-ovuled ; style filiform, white ; stigmas various in the same head, sometimes linguiform, in other cases bifid with the lobes either equal or one much shorter than the other. In marshy places among tall grasses along the banks of streams at an elevation of 5000 ft., near Lopollo, abundant ; fl. 26 March and April 1860. No. **522**.

2. **SCABIOSA** Tourn., L. ; Benth. & Hook. f. Gen. Pl. ii. p. 159.

1. **S. Columbaria** L. Sp. Pl., edit. i. p. 99 (1753); Hiern in Oliv. Fl. Trop. Afr. iii. p. 252.

Huilla.—Flowers in the living state violet-skyblue, soon turning pale and whitish-yellow. In wooded meadows with short herbage between Mumpulla and Nene ; fl. Oct. 1859. Seen nowhere else except about Lopollo. One of the innumerable forms of this species. No. **520**. In wooded meadows about Lopollo, near Catumba and by the lake of Ivantâla ; fl. Dec. 1859 ; fr. Feb. 1860. No. **521**.

LXXI. COMPOSITÆ.

Welwitsch considered that in his herbarium from Angola proper, the proportion of Compositæ to the phanerogamic vegetation, as expressed in the number of species, was about a sixteenth part ; whereas Robert Brown in the appendix to Tuckey's *Expedition* stated, p. 445, that in the herbarium from the Congo Compositæ formed only one twenty-third part. In Welwitsch's herbarium from Benguella and Huilla, the proportion was estimated at one-ninth, or perhaps one-tenth, thus approaching nearer to that prevailing in the flora of the Cape of Good Hope,

where of all parts of the world the Compositæ probably form the greatest proportion.

Several of the species formerly considered to be endemic at the Cape extend to Benguella; and not a few of the plants of the Gariep district are properly speaking tropical African, such as *Placus gariepinus*; these were at first reckoned as peculiar to the Cape flora, because they were originally described from specimens obtained there, although in truth they were but little more than stragglers.

Many of this family, whether they are in the adult form herbs shrubs or trees, present a very different habit during their early stages, even though they at such early age perfect their flowers and fruits; examples of this difference occur in the genus *Placus*; and corresponding differences are noticeable in *Grangea*, *Sphæranthus* and *Cotula*.

Some species occur with vertical phyllodes, just as in the leguminous genus *Cracca*; they may, perhaps, on this account be regarded as a surviving remnant in this continent of a portion of the Australian flora.

The permanence in Angola of certain introduced Compositæ is very remarkable.

In the primæval forests of the mountainous region several arborescent species occur; various small trees and shrubs, called *molâlu* by the natives, furnish tonic-bitter barks and are frequently employed in cases of fever and diarrhœa. In the littoral region the Compositæ are comparatively few, but in the mountainous region they abound, and they gradually increase in the highland region both in number of species and in elegance of form. At Loanda *Lactuca goræensis* affords an excellent salad. The *Cravo de defunto*, a species of *Tagetes*, is generally cultivated; the sunflower was noticed in cultivation only in the district of Pungo Andongo; the endive and some varieties of lettuce are occasionally cultivated in Angola.

Tribe I. Vernoniaceæ.

1. **ETHULIA** L. f. Decas i. p. 1. t. 1 (1762); Benth. & Hook. f. Gen. Pl. ii. p. 224.

Pirarda Adans. Fam. Pl. ii. p. 499 (1763).

1. **E. conyzoides** L. f., *l.c.*; O. & H. in Oliv. Fl. Trop. Afr. iii. p. 262.

Pirarda conyzodes O. Kuntze, Rev. Gen. Pl. i. p. 355 (1891).

Loanda.—A slender shrub, 3 ft. high, with flaccid-tender leaves and purple flowers. In fields formerly planted with manihot, between Mangue Schut and Quicuxe; fl. June 1858. No. **3326**.

Barra do Bengo.—An annual or biennial herb; stem straight, of a pretty rosy-purple or blood-red colour, corymbosely branched towards the apex; leaves serrate-dentate, pellucid-punctate; flowers rosy; achenes epappose. By swamps along the banks of the river Bengo (or Zenza); fl. and fr. Dec. 1853. Also at the banks of the river Bengo near Santo Antonio; fr. Jan. 1854. No. **3333**.

AMBACA.—In damp places on the left bank of the river Caringa; fl. and fr. June 1855. No. **3384**. An erect, branched herb, 2 to 4 ft. high, with purple or violet-rosy flowers. In bushy places by swamps near Izanga and at the banks of the river Lucala, sparingly; fl. Oct. 1856. No. **3385**.

PUNGO ANDONGO.—A herb, 2 to $2\frac{1}{2}$ ft. high, with a ruddy stem and pretty violet-coloured flowers. By streams in Sobato Cabangas; fl. and fr. 11 Jan. 1857. No. **3386**.

HUILLA.—Capitula corymbose, homogamous; corolla violet-purple, tubular, 5-cleft to the middle, sub-campanulate at the throat, with oblong-lanceolate obtuse lobes; style relatively large, with lanceolate rather compressed pointed densely puberulous branches. At the herbaceous margins of streams between Lopollo and Monino; fl. and fr. Jan. 1860. No. **3381**. Flowers purple. In marshy places between the lake of Ivantâla and Quilengues, along the banks of the river Cacolobar; fl. and fr. end of Feb. 1860. No. **3382**. Two feet high; leaves simple; capitula corymbose, purplish. Same place and date. COLL. CARP. 689.

2. **E. monocephala** Hiern, sp. n.

A nearly glabrous perennial herb; stem slender, rooting and often branched at the base, ascending or erect and simple above the base, leafy except towards the apex and base; leaves alternate, linear, obtuse, sessile, mostly erect or ascending, entire, $\frac{1}{2}$ to $1\frac{1}{4}$ in. long, apparently somewhat succulent in the living state and wrinkled in the dry; capitula campanulate, $\frac{1}{5}$ to $\frac{1}{4}$ in. in diameter (exclusively of the corollas), many-flowered, solitary, terminating the stems, on a naked peduncle of $1\frac{1}{2}$ to $3\frac{3}{4}$ in. long; involucral bracts pauciseriate, lanceolate or oblong, sub-obtuse, adpressed, imbricate, unequal, slightly puberulous on the back or the upper ones ciliolate, the inner ones the longest, somewhat purple-coloured about the tip; corollas about $\frac{1}{5}$ to $\frac{1}{4}$ in. long, all tubular, regular, narrowly obovoid-oblong, somewhat compressed, shortly 5-lobed, purple; anther-base obtuse; style-branches exserted, puberulous, rather long, tapering, acute; achene (young) oblong, truncate at the apex, slightly narrower towards the truncate base, compressed or somewhat angular, glabrous, $\frac{1}{10}$ in. long, with a few indistinct ribs; pappus 0.

HUILLA.—At the Lopollo river; fl. and young fr. Feb. 1860. No. **3902**.

2. **GUTENBERGIA** Schultz Bip.; Benth. & Hook. f. Gen. Pl. ii. p. 224.

1. **G. polycephala** O. & H. ex Oliv. in Journ. Linn. Soc. xv. p. 95 (1876), and in Oliv. Fl. Trop. Afr. iii. p. 264.

PUNGO ANDONGO.—Flowers purple. In sandy thickets near Sansamanda, Feb. 1857; also in thickets between Condo and Quisonde on rather dry sandy clay, March 1857; fl. and fr. No. **3995**. An erect branched herb, $1\frac{1}{2}$ ft. high, often becoming woody at the base and thus biennial; flower-heads small, purple. In sandy wooded places on the left bank of the river Lutete, abundant; fl. and fr. Jan. 1857. No. **3996**. An erect annual herb, 2 to $3\frac{1}{2}$ ft. high, with violet-purple flowers. In moist sandy thickets on the left bank of the Luxillo stream, abundant there but most specimens not yet in fl.; April 1857. No. **3997**.

HUILLA.—Corollas purple; achenes obovoid, glabrous (or somewhat setulose), without pappus. In elevated sandy pastures between Empalanca and Nene; fl. and fr. April and May (rainy season) 1860. Seen nowhere else in the district. No. **3998.**

Our specimens vary much in the shape of the leaves, those of No. 3997 being oval, ranging up to 2 in. long by 1 in. broad, the upper ones alternate, the rest opposite and often with short young leafy shoots quasi-fasciculate in their axils; the achenes are 3- or 4-gonous rounded on the back and with several very delicate or obsolete ribs; they should be compared with *G. leiocarpa* O. Hoffm. in Engl. Pfl. Ost-Afr., C., p. 402 (1895), and are referred as above with some doubt.

3. **BOTHRIOCLINE** Oliv.; Benth. & Hook. f. Gen. Pl. ii. p. 226.

1. **B. Schimperi** O. & H. ex Benth. in Hook. Ic. Pl. xii. p. 31, t. 1133 (1873) & in Oliv. Fl. Trop. Afr. iii. p. 266.

B. longipes N. E. Br. in Kew Bull. 1894, p. 389.

Var. **angolensis.**

A bushy herb, with a straight leafy little trunk of 5 to 6 ft. high, dividing into erect-spreading branches; branchlets pallid, striate-sulcate, puberulous; leaves, at least the upper ones, mostly alternate, rarely opposite, elliptical, acuminate or cuspidate at the apex, wedge-shaped at the base, sparingly scattered with adpressed hairs, pale-green, paler beneath, membranous, minutely glandular-punctate, very sweetly balm-scented, sharply toothed, $2\frac{1}{4}$ to $4\frac{1}{2}$ in. long by $\frac{3}{4}$ to $1\frac{3}{4}$ in. broad; petiole $\frac{1}{8}$ to $\frac{3}{4}$ in. long, pilose, often sub-alate by the sub-decurrent blade, widened ribbed and more or less clasping at the base; capitula campanulate or hemispherical, $\frac{1}{4}$ to $\frac{1}{3}$ in. long, on slender puberulous pedicels of $\frac{1}{5}$ to $\frac{2}{5}$ in. long, arranged in broad corymbose sparingly bracteolate cymes terminating the branches; bracteoles narrow, more or less hairy; involucral scales from ovate to lanceolate- or linear-oblong, puberulous or glabrate, unequal, pointed or acute at the apex, mostly about 3-ribbed down the greenish back, with scarious or coloured margin minutely denticulate towards the apex; corolla lilac-purple, with the tube glandular-hairy especially at the narrowed base, and with 5 narrow acute lobes; style-branches rather shorter than the corolla-lobes; achenes glabrous, mostly curved downwards, with about 5 deep furrows and a very few caducous bristles; receptacle areolate.

PUNGO ANDONGO.—In the thickets of the præsidium near Cabondo, sparingly; fl. and fr. end of April 1857. No. **4002.**

Var. **huillensis.**

An annual herb, $\frac{1}{2}$ to 2 ft. high; stem erect, simple or branched, pallid, sulcate-striate, pubescent or scabrid at least above; branches opposite or alternate, erect-patent; leaves elliptical, pointed or somewhat acuminate at the apex, more or less attenuate into the petioles at the base, membranous, minutely pellucid-punctate, sparingly scattered with hispidulous hairs, closely toothed, 1 to 4 in. long by $\frac{1}{2}$ to $1\frac{1}{2}$ in. broad, pale green above, paler beneath, the lower ones opposite, the upper alternate; petioles $\frac{1}{12}$ to $\frac{1}{3}$ in. long, pubescent, more or less clasping at the base; capitula homogamous,

campanulate or broadly so, $\frac{1}{3}$ to $\frac{3}{8}$ in. long, on unequal densely pubescent pedicels ranging up to nearly an inch in length, arranged in comparatively small corymbose cymes ranging up to 2 in. in diameter terminating the stem and branches; involucral scales unequal from ovate and obovate to linear-lanceolate, pointed apiculate or acute, minutely whitish, ciliolate, rigid, bright green with narrow scarious margins; corolla 5-cleft, lilac, beset with minute orange-coloured glands, the tube narrowed towards the base, the lobes filiform; style-branches shorter than the corolla-lobes; achene quite glabrous, curved downwards, obtusely 5- or 4-angular or more or less compressed, deeply furrowed between the ribs, truncate at the apex, without pappus-setæ when ripe, but when young furnished with few (2 or 3) very tender web-like hyaline very brittle setæ longer than itself; furrows of the achene marked with very minute and very densely crowded brick-red granules recalling the fine lines of Graphideæ.

Huilla.—In half-shady grassy wooded places between Ferrão da Sola and Jáu, abundant; fl. and fr. end of April, and in May 1860. No. **4003**.

2. **B. misera** O. Hoffm. in Bol. Soc. Brot. xiii. p. 11 (Sept. 1896). *Vernonia misera* O. & H. in Oliv. Fl. Trop. Afr. iii. p. 278.

Loanda.—An erect branched annual herb, 2 to 3 ft. high, with purplish flowers. In sandy places, especially in fields planted with *Manihot utilissima* Pohl, to the south of the city of Loanda and near Cabo Lombe, abundant; fl. June. No. **3306**. In sandy fields at Museque do Luiz Gomes; fl. and fr. May 1854. No. **3307**. An annual herb with a serratuloid habit, sub-corymbose capitula, and red flowers. In plantations of *Manihot utilissima* Pohl, abundant in the district; achenes, May 1854. Coll. Carp. 678.

Barra do Bengo.—A gray erect annual herb, with purple flowers. In fields sown with *Manihot utilissima* Pohl, near Cacuaco; fl. and fr. Sept. 1854 & 1857. No. **3308**, and Coll. Carp. 679.

4. **VERNONIA** Schreb.; Benth. & Hook. f. Gen. Pl. ii. p. 227.

1. **V. jugalis** O. & H. in Oliv. Fl. Trop. Afr. iii. p. 270.

Golungo Alto.—A perennial herb; rhizome woody, forming numerous heads; flowers purple. On the drier hills in Sobato Mussengue; fl. and young fr. May 1855. No. **3323**. Flowers blue. In fields at Vazea Canaûla; fl. and fr. June 1856. No. **3324**.

Cazengo.—An erect or obliquely ascending branched herb, 3 ft. high, with red flowers. In thickets at the base of the mountains of Serra de Muxaula; fl. and fr. June 1855. No. **3321**.

Var. **Dekindtii**.—*V. Dekindtii* O. Hoffm. in Bol. Soc. Brot. xiii. p. 18 (1896).

Leaves elliptical, denticulate or sub-entire, ranging up to 6 in. long by $2\frac{3}{4}$ in. broad; petiole to nearly 1 in.; receptacle alveolate in fruit or only areolar.

Golungo Alto.—A herb of 3 to 4 ft.; flowers soon after expansion beautifully blue, at length turning violet-red. In wooded places previously subjected to cultivation, at the base of the mountains of the central Queta, fl. and young fr. June 1856. No. **3322**. Bança de Bumba: fl. and fr. June 1856. No. **3325**.

2. **V. Kreismanni** Welw. ms., sp. n.

A small tree, 5 to 8 ft. or more high, with a straight trunk 1 to $2\frac{1}{2}$ in. in diameter, or a shrub of 5 to 6 ft.; branchlets subterete, more or less densely clothed with a short pallid felt, leafy; leaves alternate, entire or minutely and remotely denticulate, ovate or oval, shortly apiculate at the obtuse or sub-acuminate apex, unequal and obtuse or sub-cuneate at the base, thinly coriaceous, very bright-green, thinly scattered with minute glands and glabrate or thinly hairy above, clothed with a snow-white felt beneath, 2 to 5 in. long by 1 to 2 in. broad; lateral veins 6 to 8 on each side of the midrib, very slender on the upper face; capitula homogamous, about 15-flowered, with an ovoid pluriseriate involucre about $\frac{1}{2}$ in. long surmounted by a thick bundle of persistent pappus exceeding the involucre by about $\frac{1}{4}$ in., the whole head being somewhat constricted across the middle and presenting the shape of a thick shaving-brush, arranged on pedicels of $\frac{1}{8}$ to $\frac{5}{8}$ in. in terminal branched corymbs 2 to 6 in. in diameter; involucral scales varying from rotundate to oblanceolate, ranging up to $\frac{1}{3}$ in. long, dry, 1-nerved, concave, hard glabrous and greenish except the subscarious ciliolate whitish margins, darker about the tip; corolla purple or of a whitish-violet colour, tubular, narrowly funnel-shaped, deeply 5-cleft, segments from a broad base gradually acuminate, spreading, glabrous or scattered externally with some minute glands; anthers with rather long tails at their base; achenes compressed-quadrangular, branny-glandular between the angles, otherwise glabrous, $\frac{1}{8}$ to $\frac{1}{6}$ in. long; pappus biseriate, pale straw-coloured, setose, $\frac{1}{4}$ in. long, the outer row of setæ short squamiform and fimbriate-denticulate at the apex, the inner row elongated, rather rigid, thick, sub-compressed, shortly and densely pilose, slightly tawny towards the apex; style-branches subulate.

Huilla.—In clearances of the forests of Catumba, where in March 1863 the Munanos pitched their camp, sporadic and not frequent; fl.-bud, end of Oct.; fl. and young fr. Dec. 1859. No. **3260.** In the rocky forests of Morro de Lopollo, after the shedding of the fr., Jan. 1860. A bush form, apparently of this species. No. **3251.**

The foliage of this plant somewhat suggests that of *Tarchonanthus camphoratus* L. It belongs to the section Lepidella, or possibly it might be placed in Hoffmann's section Lampropappus, to which it approaches.

3. **V. Burtoni** O. & H. in Oliv. Fl. Trop. Afr. iii. p. 281.

A rough herb, $2\frac{1}{2}$ to 4 ft. high, with the habit of a *Placus*, presenting in fruit a shabby appearance, strictly erect, somewhat shrubby at the base, branched in the upper part; stem and elongated branches striate, scabrid, terete, purplish below, somewhat tawny above, hispidulous; leaves alternate, broadly ellipsoidal, shortly narrowed to an apiculate apex; narrowed in an acuminate manner to a sessile or subsessile base, membranous, yellowish-green and more or less scabrid above, somewhat tawny or paler or subglaucescent and more or less rough with hispidulous hairs beneath, 2 to 6 in. long by $\frac{3}{4}$ to $2\frac{3}{4}$ in. broad; midrib

and lateral veins slender; margin denticulate with short subulate teeth directed forward in continuation of a veinlet; capitula campanulate, $\frac{1}{5}$ to $\frac{1}{4}$ in. in diameter, about 40-flowered, on unequal, short or very short densely hispidulous often bracteate pedicels, arranged in compound thyrsoid terminal oblong obtuse cymes 4 to 6 in. in diameter; bracts sub-linear, hairy; involucral scales pluriseriate, sublinear or lanceolate, pointed, beset with whitish curly hairs outside, glabrous inside, more or less apiculate, becoming more or less squarrose at the tips in fruit; the outer scales short and sublinear, the inner longer and linear-lanceolate, the innermost longest and lanceolate or sublinear, persistent, $\frac{1}{6}$ in. long; corolla purple or rose-purple, $\frac{1}{6}$ in. long, narrowly funnel-shaped, scattered with minute glands outside, shortly 5-lobed, the lobes lanceolate; anthers with lanceolate tails at their base, the apical appendages lanceolate; style-branches slightly puberulous, tapering; achene $\frac{1}{12}$ in. long, unequally tetragonous, 4- or 5-ribbed, glabrous on the ribs, glandular and hispidulous between the ribs; pappus biseriate, whitish or somewhat sordid, outer row short, narrowly paleaceous, cut on the margin; inner row setaceous, $\frac{1}{6}$ in. long, the setæ barbellate, narrower than those of the outer row; receptacle nearly flat, narrow, areolate.

Golungo Alto.—In Serras de Bumba and at the outskirts of the forests of Sobato de Mussengue; fl. and fr. Aug. 1855. Also by wooded thickets in Sobato de Mussengue, rather rare; the leaves destroyed by insects; fr. June 1856. No. **3296**.

Ambaca.—By thickets along the left bank of the river Caringa, abundant but only one specimen seen in fl. June 1855. No. **3298**.

Pungo Andongo.—In thickets on the island of Calembe in the river Cuanza, sporadic; fl. March 1857. Only one specimen. No. **3297**.

As the account of this species in the Flora of Tropical Africa was taken from the comparatively poor specimen collected by Consul Burton in the Congo district, and as Welwitsch's specimens greatly extend our knowledge, a detailed description is here supplied.

4. **V. pandurata** Link, Enum. Hort. Berol. ii. p. 296 (1822); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 271.

Ambriz.—An annual herb, 6 to 15 in. high, growing in dense masses, corymbosely branched above; involucral scales and corollas bright purple. Abundant on sandy plains between Mossul and the town of Ambriz, gathered in flight under pursuit by the stone-throwing Musuls; fl. and fr. Nov. 1853. No. **3316**.

Loanda, Barra do Dande, and Barra do Bengo.—An erect branched herb, $1\frac{1}{2}$ to 2, or even 3 to 4 ft. high, with pretty purple flowers. In moist fields between Quicuxe and Teva; fl. and fr. July and Aug. 1858. No. **3317**. Flowers light-blue or reddish-brown. In damp bushy places at the river Bengo near Quifandongo; fl. and fr. Dec. 1853. No. **3318**.

Golungo Alto.—Among scanty bushes on the left bank of the river Quiapoze by the road leading to Mussengue, rather rare; late fl. and fr. beginning of Oct. 1855. No. **3319**. An erect herb, 2 to

3 ft. high, flowers of a reddish-violet colour. In wooded situations near Menha-Lula ; fl. and fr. June 1856. No. **3320**.

5. **V. Welwitschii** O. Hoffm. in Bol. Soc. Brot. x. p. 170 (1893).

Mossamedes.—Flowers bright-purple. In sandy thickets at the banks of the river Maiombo ; fl. and fr. Oct. 1859. No. **3363**.

6. **V. rhodophylla** O. Hoffm., *l.c.*, xiii. p. 19.

Huilla.—Flowers purple. In rather elevated bushy mountainous places in Serra (Morro) de Lopollo, formerly pastures ; fl. and fr. April and May 1860. No. **3340**.

7. **V. daphnifolia** O. Hoffm., *l.c.*, p. 18.

Huilla.—A cæspitose herb ; rootstock thick, woody, many-headed, perennial ; flowers violet-purplish. In fairly dry sandy-clayey thickets near Lopollo, rather rare ; fl. and fr. beginning Dec. 1859. No. **3344**.

8. **V. lappoides** O. Hoffm., *l.c.*, p. 19.

Pungo Andongo.—A perennial erect herb, with membranous leaves and purple corollas. In rocky thickets within the præsidium, not abundant ; fl. and fr. middle of Feb. 1857. No. **3294**.

9. **V. Perrottettii** Schultz. Bip. ex Walp. Repert. ii. p. 947 (1843) ; O. & H. in Oliv. Fl. Trop. Afr. iii. p. 272 (*Perrottetii*).

Webbia serratuloides DC. Prodr. v. p. 72 (1836).

Pungo Andongo.—An annual, strictly erect herb, with pallid-purple flowers. Between Lombe and Candumba, in places with scanty herbage, rather rare, but growing in masses ; fl. end of March 1857. No. **3365**.

10. **V. ambigua** Kotschy & Peyr. Pl. Tinn. p. 35. t. 17 B (1867); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 272.

Pungo Andongo.—An annual, erect, much branched herb, 4 to 5 in. high, with purple or purplish corollas. In sandy thickets near Sansamanda, not far from the banks of the river Cuanza, sparingly ; fl. beginning of April 1857. Also in sandy bushy places near Mopopo, very rare ; fl. and fr. 30 April 1857. No. **3304**.

11. **V. Petersii** O. & H. ex Oliv. in Trans. Linn. Soc. xxix. p. 90 (1873) and in Oliv. Fl. Trop. Afr. iii. p. 273.

Huilla.—Flowers purple. In sandy thickets near Lopollo ; fl. and fr. March and April 1860. No. **3301**. In neglected fields on a sandy soil near Lopollo ; fl. and fr. end of May 1860. No. **3302**. In neglected fields near Eme ; fl. and fr. April 1860. No. **3303**.

Mossamedes.—An annual erect herb, with violet-purple flowers. In gravelly places at the banks of the river Bero, rather rare ; fl. and fr. July 1859. No. **3305**.

12. **V. Poskeana** Vatke & Hildebrandt in Oesterr. Bot. Zeitschr. xxv. p. 324 (1875) ; O. & H. in Oliv. Fl. Trop. Afr. iii. p. 274.

Crystallopollen angustifolium Steetz in Peters, Mossamb. Bot. p. 366 (1863).

a. **Vulgaris** Steetz, *l.c.*

Pungo Andongo.—An annual erect herb, growing in vast abundance and in dense masses, colouring violet the moist meadows between

Quisonde and Condo ; fl. and young fr. middle of March 1857. No. **3374**. A slender annual herb, with violet-purple flowers, remarkably gregarious and growing in dense masses in company with the variety *chlorolepis* ; in moist wooded meadows by the river Cuanza, near Sansamanda, colouring violet very wide tracts ; fl. and young fr. 1 May 1857. No. **3375** (partly).

β. **Chlorolepis** (Steetz, *l.c.*) O. Hoffm. in Bol. Soc. Brot. x. p. 171 (1893).

V. Steetziana O. & H. in Oliv. Fl. Trop. Afr. iii. p. 273.

Golungo Alto.—A grey herb, 2 ft. high, with a broom-like habit and reddish flowers, the heads resembling those of a *Centaurea* ; in dry places by thickets between Canaûlo and Ambaca, abundant ; fl. and young fr. May 1856. No. **3376**.

Pungo Andongo.—A gregarious, erect, annual herb, with deep-purple flowers ; in very elevated, grassy, rocky parts of Pedra de Cazella within the præsidium, abundant ; fl. and fr. May 1857. Also in sunny situations amongst the rocks of the præsidium, fl. and fr. very rare, middle of Jan. 1857. No. **3370**. Flowers purple ; in wooded meadows between the fortress of Pungo Andongo and Mangue ; fl. and fr. March 1857. No. **3371**. An annual erect herb, branched in a broom-like manner ; leaves lanceolate, bright-green above, with whitish raised nervation beneath ; flowers purple ; in elevated herbaceous parts of Pedra Cabondo ; fl. and fr. 17 April 1857. No. **3373**. With the form *vulgaris* by the river Cuanza. No. **3375** (partly).

Mossamedes.—In blown sand ; fl. July 1859. A simple plant with linear leaves, only one specimen, apparently this variety. No. **3368**.

Huilla.—Flowers purple ; in exposed wooded places amongst thickets near Catumba ; fl. and fr. April and May 1860. No. **3366**. A rather rigid undershrub, with a straight stem and purple flowers ; in thin forests between Nene and Mumpulla, sparingly ; several specimens seen, but only one in fl. ; in company with plants of *Faurea*, end of May 1860. No. **3367**.

γ. **Hoffmanni**.

V. Perrottetii, forma microcephala, O. Hoffm. in Bol. Soc. Brot. x. p. 170 (1893) ; vix Schultz Bip.

Pungo Andongo.—At the sandy outskirts of forests between Condo and Quisonde, not far from the river Cuanza ; not yet in full fl. March 1857. No. **3372**.

Mossamedes.—An erect or ascending annual herb, 2 ft. high, with alternate linear leaves and purple flowers. In sandy places at the banks of the river Bero, not far from the estuary, rather rare ; fl. and fr. end of July 1859. No. **3339**.

Huilla.—Flowers purple ; in bushy places in coarse sandy places between Ferrão da Sola and Jâu ; fl. and fr. beginning of May 1860. No. **3369**.

13. **V. cinerascens** Schultz Bip. in Schweinf. Fl. Æthiop. p. 162 (1867) ; O. & H. in Oliv. Fl. Trop. Afr. iii. p. 275.

Loanda.—A shrub, 3 to 4 ft. high ; branches divaricate, brittle ; the whole plant very rigid, even the leaves which are rather fleshy turning rigid ; flowers purple. On sandy and rocky hills near Alto das Cruzes, rare in other places ; fl. and fr. Dec. 1854 and Jan. 1858. No. **3379**. A herb, 3 to 5 ft. high ; stems cæspitose or crowded, ascending or suberect ; branches and branchlets brittle, rigid, scaly-

pubescent or sometimes even tomentose ; leaves fasciculate, glaucescent-hoary, rather fleshy, rigid, obovate-spathulate, emarginate, subdentate ; capitula of a deep blue-purple colour, homogamous ; corolla tubular-campanulate, 5-cleft ; the pappus remarkably developed before the opening of the flowers. Only near Alto das Cruzes above the city of Loanda, in rough steep situations, not abundant ; fl. and fr. middle of Dec. 1858. No. **3380**.

14. **V. cinerea** Less. in Linnæa iv. p. 291 (1829) ; O. & H. in Oliv. Fl. Trop. Afr. iii. p. 275.

Conyza cinerea L. Sp. Pl., edit. 1, p. 862 (1753).

Barra do Bengo.—An erect herb, with reddish flowers. At the banks of the river Bengo near Quifandongo, abundant ; fl. and fr. 12 Sept. 1854. No. **3907**.

Icolo e Bengo.—In wet places in palm-groves by the river Bengo near Panda ; fl. and fr. Dec. 1853. No. **3908**.

Golungo Alto.—No notes. Fl. and fr. No. **3906**.

With this species must be compared Nos. 3309 to 3314, mentioned under *V. undulata* O. & H., some of which agree fairly well with a specimen in Herb. Kew. from Angola collected by Monteiro and considered in the Flora of Tropical Africa iii. p. 276 as a form of the latter species or perhaps a new species ; they occupy an intermediate position between the two species with respect to the degree of acuteness of the involucral scales, and there are almost corresponding forms in tropical Asia.

15. **V. undulata** O. & H. in Oliv. Fl. Trop. Afr. iii. p. 276 ; O. Hoffm. in Bol. Soc. Brot. x. p. 171 (1893).

Golungo Alto.—In neglected fields and by roadsides between Trombeta and Cabondo ; fr., most of the corolla having fallen, Sept. 1854. No. **3311**. A perennial herb, 1 to 2 ft. high ; rootstock rather woody, many-headed ; flowers very bright-purple. On sunny elevated declivities in Sobato de Quilombo ; fl. and fr. Sept. 1855. No. **3312**. A perennial herb, 1½ to 2½ ft. high ; root many-headed ; stem erect ; corollas of a red-violet colour, soon deciduous. At the outskirts of primitive forests and in palm-groves, between Calôlo and Trombeta ; fl. and fr. Sept. 1855. No. **3313**. A perennial herb, 1 to 1½ ft. high ; root woody ; stems several, erect from the middle, leafy when young ; involucral scales lanceolate, acuminate-subulate, reddish, delicately pubescent, uninerved ; corollas prettily purplish ; achenes obcuneate, the younger ones subcompressed and more or less pilose ; pappus biseriate, always white, the outer row spreading, one-third as long as the hispidulous inner row. In fields after a crop of *Arachis hypogæa* L. by the road between Sange and Camilungo ; fl. and fr. July 1855. A form with the involucral scales a little more acute than in the type (O. Hoffm., *l.c.*). No. **3314**. A suffruticose herb, 3 to 5 ft. high ; rhizome woody ; stem at the base as thick as a man's finger, soon patently branched ; branches slender, elongated, scandent ; corollas violet-purplish. In the more elevated forests of Sobato Quilombo ; fl. and fr. middle of July 1856. A form with broadly ovate, remotely toothed leaves, ranging up to 2 in. long by 1½ in. broad. No. **3268**.

Ambaca.—Flowers purple. In moist places on the left bank of the river Caringa ; fl. June 1855. A form with more oval-oblong leaves. No. **3309**.

Pungo Andongo.—A perennial herb ; rootstock thick, many-headed ; stems cæspitose erect or ascending, 1 to 1½ ft. high ; involucral scales

acuminate-subulate, uninerved ; corollas beautifully purplish ; achenes obcuneate, somewhat pilose ; pappus biseriate, always white. In neglected fields formerly cultivated between Cazella and Luxillo, not common ; fl. and fr. May 1857. No. **3310**. An erect herb, 2 to 3 ft. high, with intensely violet-purple flowers. In bushy places near Luxillo ; fl. and fr. April 1857. A form with the ripe achenes strongly ribbed. No. **3315**.

Huilla.—Flowers violet-coloured. At the outskirts of forests, with tall herbage, between Lopollo and Jáu, fl. and fr. end of March 1860. No. **3341**. Corollas purple. In wooded places near Ivantâla ; one specimen, fl. beginning of March 1860. No. **3342**.

As to the connection between this species and *V. cinerea* Less., see the note under that species. No. 3268 mentioned above may be distinguished as a variety and called **golungensis**; besides the characters included in the note accompanying the No., it has broadly ovate paucidentate nearly glabrous leaves, and very obtuse subglabrous shining involucral scales, the innermost ones with somewhat coloured tips, and the habit is very lax ; possibly it is a distinct species.

16. **V. Smithiana** Less. in Linnæa vi. p. 638 (1831) ; O. & H. in Oliv. Fl. Trop. Afr. iii. p. 276.

Webbia ? Smithiana DC. Prodr. v. p. 72 (1836).

Pungo Andongo.—A very elegant undershrub, silvery-shining, with a long-fibred woody rootstock and purple flowers. In sandy thickets between Cazella and the river Lutete ; fl. and fr. Jan. 1857. No. **3337**.

17. **V. natalensis** Schultz Bip. ex Walp. Rep. Bot. Syst. ii. (Suppl. i.) p. 947 (1843) ; O. & H. in Oliv. Fl. Trop. Afr. iii. p. 277.

Webbia aristata DC. Prodr. v. p. 73 (1836). *V. aristata* Schultz Bip. in Flora 1844, p. 667 ; non Less. (1829).

Huilla.—Corolla purple. In hilly situations among short grass near the lake Ivantâla ; fl. and fr. Feb. 1860. A form with the involucral bracts attenuately subulate-apiculate. No. **3338**.

18. **V. pinifolia** Less. in Linnæa iv. p. 257 (1829) ; Harv. in Harv. & Sond. Fl. Cap. iii. p. 51 (1865).

Conyza pinifolia Lam. Encycl. Méth. ii. p. 86 (1786). *Webbia pinifolia* DC. Prodr. v. p. 72 ; Hook. in Bot. Mag. t. 5412 (1863).

Ambaca.—An undershrub, with numerous stems from a woody rootstock, silvery-shining foliage, and deep violet-purple flowers. In hilly stony places between the river Lucala and Zamba ; fl. and fr. Oct. 1856. No. **3335**.

Huilla.—In rather dry hilly places amongst low bushes in the Lopollo country, in company with Thymelæaceæ ; fr. March 1860. No. **3336**. By the way to Ivantâla ; fl.-bud Feb. 1860. Probably this species. No. **3377**.

19. **V. teucrioides** Welw. ex O. Hoffm. in Bol. Soc. Brot. x. p. 171 (1893).

Golungo Alto.—A perennial herb with a woody rootstock or a little undershrub with habit of a *Teucrium* ; stems cæspitose, branched, bearing corymbs at their apex and on the branchlets, tomentose with white felt ; leaves alternate, sessile, green above, white-tomentellous beneath, with the reticulation impressed on the upper face and in

relief on the lower; flowers very prettily rosy-purple; capitula homogamous, discoid, about 12-flowered; involucral scales not numerous, rather lax, imbricate, broadly lanceolate, rather pilose on the back, the inner ones longer than the outer, gradually subulate at the apex; corolla tubular, a little widened towards the apex, deeply 5-lobed; the segments linear-lanceolate, rather obtuse, erect-patent, not reflexed; anthers bi-caudate at the base, with the apical appendage lanceolate-acuminate; style-branches tardily exserted, subcylindrical, acutely subulate at the apex, pubescent; achene curved downwards, truncate, hispidulous, somewhat angular-compressed; setæ of the pappus hispid, partly biseriate; those of the inner row becoming white, strict, almost as long as the corolla; those of the outer row few, a quarter the length of the inner ones, occasionally almost reduced to none or only single. In sunny somewhat stony pastures on the summits of the mountains of Serra de Alto Queta in company with *Pleiotaxis* (Welw. Herb. No. 3893) and *Dicoma anomala* Sond. (Welw. Herb. No. 3613), abundant; fl. and fr. Nov. and Dec. 1855. Also on elevated rather dry declivities amongst the mountains of Alto Queta; scarcely fl. Sept., fl. and young fr. Nov. 1855. No. **3332**.

20. **V. sculptifolia** Hiern, sp. n.

Shrubby; stem or branches leafy, dusky and covered with a short thin pallid felt below, with a thicker pale yellowish-white felt above, terete, 2½ ft. high or more, divided at or near the inflorescence; leaves alternate, spreading, oval-oblong, obtusely narrowed at the scarcely apiculate apex, wedge-shaped or obtuse at the sessile or subsessile base, firmly subcoriaceous, glabrescent, scabrid yellowish-green and with impressed venation on the upper face, softly felted whitish and with raised venation on the lower face, 1 to 3 in. long by ⅓ to 1 in. broad, denticulate or subrepand on the margin; capitula campanulate, ⅔ in. long, on short woolly pedicels arranged in a dense compound corymbose terminal cyme 3 to 6 in. in diameter; involucral scales pauciseriate, acute, glabrous on the inner face, woolly on the outer; the outer ones narrow, ⅓ in. long, the outer ones lanceolate, ⅓ in. long; corollas purple, ⅓ in. long, salver-shaped, shortly 5-cleft, scattered with small glands outside; lobes lanceolate, acute; anthers with acute tails at the base and acutely produced at the apex; style exserted, with two puberulous rather short tapering branches; nectary elevated, small, fleshy, surrounding the base of the style; achenes setulose, obscurely about 7-ribbed; pappus about ⅓ in. long, sordid, in one row with a few outer short setæ; the setæ hispidulous; receptacle somewhat foveolate.

Huilla.—In rather dry wooded thickets between Monino and Eme; fl. and fr. April 1860. No. **3333**. At Lopollo; fl. and fr. Dec. 1859. No. **3334**.

Nearly related to *V. tecurioides* Welw.

21. **V. pratensis** Hiern, sp. n.

An erect rather slender scabrid herb, 2½ ft. high or more; stem simple below the inflorescence, hispidulous, sulcate-striate, angular above, uniformly leafy; leaves alternate, directed upwards, lanceolate, rather obtuse, callus-tipped, rounded at the

subsessile base, green on both faces, rather paler beneath, membranous, rigid, scabrid, not pubescent, marked with minute impressed pellucid points, 1 to $2\frac{1}{2}$ in. long by $\frac{1}{7}$ to $\frac{4}{7}$ in. broad; margin narrowly revolute, entire or rough with a few short prickles; internodes shorter than the leaves; capitula campanulate-hemispherical, $\frac{1}{4}$ to $\frac{1}{3}$ in. in diameter, several-flowered, subsessile on the branches of the cyme or on scabrid angular rather slender rigid pedicels ranging up to an inch long, arranged in a compound bracteate (or somewhat leafy) terminal corymbose panicle about 4 in. in diameter; bracts like the leaves but smaller; involucral scales pluriseriate oblong, oblanceolate or linear, obtuse, somewhat pale-cottony outside, unequal, ranging up to $\frac{1}{4}$ in. long, more or less straw-coloured below, dark or purplish and often quasi-appendiculate towards the apex, the lower ones often subapiculate; corollas purple, rather more than $\frac{1}{4}$ in. long, narrowly tubular, gradually and not much widened upwards, with 5 linear-lanceolate sub-acute lobes; anther-tube acutely sagittate at the base and with lanceolate appendages at the apex; style-branches puberulous, tapering, shortly exserted at the apex; achenes ob-pyramidal, $\frac{1}{15}$ in. long, about 6-ribbed, scattered with small glands and short hairs; pappus slightly straw-coloured, biseriate; the outer setæ short, the inner $\frac{1}{6}$ in. long, nearly smooth.

Huilla.—In the wooded meadows (varzeas) of Catumba towards Hay; fl. and fr. April 1860. No. **3364**.

22. **V. catumbensis** Hiern, sp. n.

An undershrub, 4 ft. high or more; stem densely leafy below, divaricately branched above; branches elongated, purple, sulcate-striate, terete, somewhat pubescent with whitish curly hairs; leaves oblong, more or less obtuse at both ends, subapiculate at the apex, rounded at the sessile or subsessile base, thinly subcoriaceous, yellowish-green, paler beneath, somewhat pubescent sometimes obsoletely so on both faces especially beneath by side of or along the midrib and principal veins, denticulate repand or subentire, $1\frac{1}{3}$ to $4\frac{2}{3}$ in. long by $\frac{1}{4}$ to $1\frac{1}{4}$ in. broad; lateral veins not conspicuous; capitula campanulate, somewhat turbinate, $\frac{3}{8}$ in. in diameter, mostly sessile and unilateral on the branches of the cyme, some on somewhat woolly pedicels ranging up to $\frac{5}{8}$ in. long, arranged in rather open terminal and axillary corymbose or paniculate cymes; bracts like the leaves but smaller; involucral scales more or less woolly outside, pluriseriate, obtuse, minutely apiculate, with scarious margins and purple tips, thick and tough in other parts, the outermost ones very short, the inner continually longer, the innermost lanceolate-oblong $\frac{1}{3}$ in. long, persistent; flowers purple, about 18 together in a capitulum; corollas $\frac{2}{5}$ in. long, gradually widened above the middle, 5-cleft; the lobes lanceolate-oblong, cohering about the middle, subobtuse; anthers obtusely tailed at the base, with lanceolate appendages at the apex; style-branches exserted, hispidulous,

tapering, curved; nectary cupuliform, minute; young achenes densely hairy, unequally trigonous, with several obscurely marked ribs; pappus straw-coloured, sub-biseriate, the outer setæ short, the inner $\frac{1}{3}$ in. long, the setæ hispidulous; receptacle areolate.

Huilla.—In wooded situations amongst tall herbs near Catumba, sporadic; not yet in full fl. April 1860. No. **3295**.

23. **V. phyllodes** Hiern, sp. n.

A smooth herb, 2 ft. high, with the habit of a *Carthamus*, pale yellowish-green, suffruticose at the base; stem terete and glabrate below, sulcate, branched in the upper part, somewhat cottony towards the apex, leafy throughout; leaves alternate, crowded, arranged after the manner of the phyllodes in the leafless acacias, oval-oblong, rather obtuse at both ends, sub-apiculate at the apex, sometimes 3-nerved at the subsessile base, fleshy-coriaceous, unicolorous, pilose when young, glabrescent or sometimes a little pilose near the base beneath, $1\frac{1}{4}$ to $2\frac{1}{2}$ in. long by $\frac{1}{4}$ to $\frac{3}{4}$ in. broad, entire; capitula broadly campanulate, $\frac{3}{4}$ to 1 in. in diameter, singly terminating the branches or a few close together terminal and subterminal (or terminating abbreviated subterminal branches), many-flowered; involucres $\frac{3}{4}$ to 1 in. long; the scales pauciseriate, sub-equally high, more or less cottony-pilose on the exposed parts of the back; the outer ones foliaceous, lanceolate-oblong, the inner ones closely imbricate, sub-obtuse, thickly coriaceous, glabrous and polished inside; corollas white, $\frac{3}{4}$ in. long, narrowly tubular with a campanulate-oblong 5-cleft often spreading dilatation in the upper part; the lobes lanceolate, narrowed to a thickened papillose tip; anther-base obtuse, not sagittate; the tube partly exserted; style-branches exserted, rather long, puberulous, spreading and incurving, pointed; achenes (young) glabrous except the base, somewhat compressed, obscurely ribbed; pappus of a pale whitish fawn colour, pluriseriate, subequal, setose; setæ closely approximated, silky, very slender, microscopically barbellate; receptacle pubescent.

Pungo Andongo.—In wooded thickets by hilly places at the river Cuanza near Sange, abundant; fl. and young fr. 1 May 1857. No. **3993**.

This belongs to the section Hololepis of the genus, and amongst the African species comes next to *V. purpurea* Schultz bip.

24. **V. Calulu** Hiern, sp. n.

Vernonia sp., Ficalho, Pl. Uteis, p. 206 (1884).

A herb, with the habit of a *Serratula*, 2 to 3 ft. high or in shady places taller; stem brittle, terete, striate, often purplish and scabrid hispidulous or glabrate below, scabrid-pubescent and somewhat fawn-coloured above, loosely branched or nearly simple, uniformly leafy throughout; leaves oval elliptical or obovate, rather shortly narrowed or rounded and apiculate at the apex, obliquely and often shortly narrowed to an obtuse or wedge-shaped base, chartaceous, very rigid, scabrous with small rough raised points and hispidulous or nearly glabrous on both faces, with raised midrib veins and veinlets beneath, 1 to 6 in. long by $\frac{1}{3}$

to 3 in. broad, strongly and sharply serrate-dentate; petioles ranging up to $\frac{1}{2}$ in. long; capitula turbinate-campanulate, $\frac{2}{3}$ to 1 in. in diameter, many-flowered, on bracteolate scabrid-hispidulous pedicels ranging up to $1\frac{1}{4}$ in. long, arranged in moderately dense terminal somewhat leafy corymbose or obovoid cymes 3 to 6 in. in diameter; bracteoles lanceolate or subulate, hispidulous, small; involucral scales multiseriate, more or less linear, minutely scabrid-puberulous on the back, scabrous-serrulate on the margins, glabrous inside, pallid except the greenish or darker subacute more or less spreading tip; the outermost ones very short, linear-subulate; the inner ones successively longer, sublinear; the innermost ones lanceolate-linear, $\frac{1}{3}$ in. long; corollas more than $\frac{1}{2}$ in. long, of a beautiful pale-azure colour, scattered with minute glands outside, narrowly tubular; style-branches long, puberulous, tapering, much curved; achenes $\frac{1}{4}$ to nearly $\frac{1}{3}$ in. long, about 10-ribbed, densely setulose, dark-brown, with a large rounded callus at the base; pappus rufous, $\frac{1}{2}$ in. long, pluriseriate, setose, the outer setæ short, all hispid with rather long setulæ; receptacle somewhat convex, areolate with the areas fringed with short thick hairs.

Golungo Alto.—In thickets near Cambondo; fl. and fr. July 1856. No. **3284**. At Trombeta; fl. and fr. Sept. 1854. No. **3285**. On bushy declivities near Sange, at Arimo do Mariano; fl. and fr. 21 July 1855. No. **3286**.

Cazengo.—In thickets; fl. and fr. June 1855. No. **3287**.

Nearly related to *V. obconica* O. & H. It is a medicinal plant, and in Golungo Alto is called "Calûlu"; the dried and rubbed leaves are employed by the native medical men for curing ulcers. According to a note of Welwitsch it occurs also in Pungo Andongo. The name *calulu*, printed *catulu* by Ficalho, *l.c.*, probably in the native language means bitter.

25. **V. huillensis** Hiern, sp. n.

An erect or ascending, hard, perennial herb, 2 to 3 ft. high, rootstock woody; stems smooth or nearly so, subterete, unequally furrowed, glabrate below, puberulous or obsoletely so in the furrows above, simple below the inflorescence, leafy especially near the base; leaves alternate, approximated near the base of the stem, the lower ones oblanceolate, the upper ones narrowly elliptical, more or less narrowed and minutely apiculate at the apex, wedge-shaped or the upper ones rather broad at the base, sub-erect, rigidly chartaceous, nearly smooth and glabrate, scattered on both faces with minute scales, denticulate and ciliolate-scabrid on the margin, $1\frac{1}{2}$ to 8 in. long by $\frac{1}{6}$ to $1\frac{1}{2}$ in. broad, sessile and somewhat clasping or the lower ones attenuate into a short petiole which dilates and somewhat clasps the stem; venation rather slender; capitula broadly campanulate with a turbinate base, $\frac{2}{3}$ to 1 in. in diameter, on unequal bracteolate puberulous firm ascending pedicels ranging up to 2 or even 4 in. long, arranged in a rather lax corymbose or obovoid terminal slightly leafy cyme 3 to 5 in. in diameter; involucre $\frac{2}{3}$ to $\frac{3}{4}$ in.

long; the scales multiseriate, more or less lanceolate, sub-acute, apiculate, puberulous or thinly pubescent on the back, scabrid-ciliolate on the margin, glabrous inside, adpressed or scarcely spreading, straw-coloured at the back except the dark-purplish tips; the outermost very short, subulate-lanceolate; the inner successively longer; the innermost oblong-lanceolate, $\frac{3}{8}$ in. long; corollas purple, about $\frac{2}{3}$ in. long (when the lobes are extended), narrowly tubular, not much dilated at the top of the tube, membranous, scattered outside with minute glands, 5-lobed; the lobes lanceolate-oblong, $\frac{1}{5}$ in. long, acute; anthers with long lanceolate tails at their base each cohering with one of an adjacent anther; filaments red; style-branches long, exserted, puberulous, tapering, curved; achenes $\frac{1}{5}$ in. long, with about 10 slender ribs, nearly glabrous or with some short setulæ between the ribs; pappus rufous, $\frac{2}{5}$ in. long, pluriseriate, setose; the setæ setulose almost plumose, the outer setæ short.

Huilla.—In hilly places, amongst tall bushes, between Nene and Humpata; also at Ferrão da Sola; fl. and fr. Jan. 1860. No. **3282**. At the herbaceous outskirts of forests near Catumba; fl. and young fr. end of March 1860. No. **3283**.

Var.? **scabrior**. Stem somewhat muriculate with scattered hard rough raised points; leaves very scabrous especially above.

Pungo Andongo.—Flowers purple. In wooded pastures between Lombe and Quibinda; only one specimen, fl. and young fr. March 1857. No. **3299**.

26. **V. carnea** Hiern, sp. n.

A very scabrous, perennial herb, 2 to 4 ft. high; rootstock thick, woody; stems several, strictly erect, simple subterete and purplish below, branched somewhat angular and pallid above, hispidulous-scabrid, striate, uniformly leafy throughout; leaves oval or somewhat obovate, broadly pointed and minutely apiculate at the apex, more or less narrowed to a sessile or subsessile slightly clasping base, thinly and rigidly coriaceous, very scabrid on both faces with rough points and stiff short hairs on the veins and margin, sharply toothed, 1 to 6 in. long by $\frac{1}{2}$ to 3 in. broad, yellowish-green above, rather paler beneath; venation slender; capitula comparatively few, $\frac{3}{4}$ to 1 in. in diameter, many-flowered, hemispherical-globose, on hispidulous-scabrid unequal bracteate pedicels ranging up to 4 in. long in a lax terminal corymbose or oblong cyme 3 to 6 in. in diameter; bracts sublinear; involucral scales multiseriate, linear, glabrous or nearly so, yellowish-green outside on the upper half, pale straw-coloured below, subobtuse, finely spinulose-serrulate on the margin, loosely imbricate, erect or ascending; the innermost the shortest but not so short as in *V. huillensis* and *V. Calulu*; corollas violet-purple or azure-blue, $\frac{5}{8}$ in. long when extended, narrowly tubular, scarcely or shortly widened at the top of the tube, 5-cleft about halfway down, scattered outside with small glands; the lobes linear, acute; anther-tube exserted except the base, flesh-coloured, sagittate-

caudate at the base, with lanceolate appendages at the apex; style-branches not much exceeding the anther-tube, puberulous, tapering, bluish; achenes short, about 8-ribbed, glabrous, somewhat glandular; pappus rufous, pluriseriate, setose; the setæ setulose-barbellate, the outermost row short, acute, scarcely squamiform.

Pungo Andongo.—In rocky thickets in the præsidium facing the south; fl. and young fr. middle of Dec. 1856. No. **3288**. In wooded pastures in Serra de Pedras de Guinga; after fall of the corollas, Jan. 1857. No. **3289**. In sandy pasture scattered with bushes near Candumba; few fl. 1857. No. **3290**.

27. **V. senegalensis** Less. in Linnæa iv. p. 265 (1829); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 283; Ficalho, Pl. Uteis, p. 205 (1884).
Decaneurum senegalense DC. Prodr. v. p. 68 (1836).

Ambriz.—Flowers purple; achenes subglabrous, with several ribs, beset with glands between the ribs; pappus setose in one row. In bushy somewhat stony situations between the town of Ambriz and Quizembo; fl. and fr. Nov. 1853. No. **3346**. A small tree, 5 to 7 ft. high, very elegant; trunk straight, bare below, 1½ in. thick, with spreading branches at the head; flowers whitish or purplish. On bushy hills next the sea, between the town of Ambriz and Quisembo; fl. and young fr. beginning of Nov. 1853. No. **3352**.

Barra de Dande.—A shrub of 5 to 6 ft., with spreading branches like a tree; flowers pale-lilac. On stony hills near Barra de Dande; fr. and few fl. Nov. 1853. The bark of the trunk and the root are very bitter, and they are held in high repute by the natives as a tonic. No. **3347**.

Loanda.—A branched shrub, 5 to 7 ft. high, branches ascending; bark bitter, furnishing an astringent decoction; flowers whitish-reddish, fragrant; corolla-tube more or less conspicuously glandular-puberulous; anthers shortly hastate scarcely tailed at the base; style pointed and quasi-stipitate at the base, from the middle towards the base remarkably compressed-flat; nectary elevated, cupuliform, delicately denticulate at the mouth or rarely entire; achene more or less clearly 10-striate, subglabrous, glandular between the ribs. About Imbondeiro dos Lobos; fl. and fr. June 1858. No. **3354**. A low tree with a widely spreading head or in cultivated districts a shrub of 5 to 6 ft.; corolla violet-whitish; involucres yellow or somewhat chestnut-green, with the scales ciliate on the margin; pappus uniseriate, turning rufous in course of drying, subentire at the base, with strict denticulate somewhat thick and rigid setæ. About ponds (represas) at Imbondeiro dos Lobos, rather rare; fl. and fr. July 1854. No. **3355**.

Zenza do Golungo.—Achenes more or less obcuneate, slightly compressed by mutual pressure, 10-ribbed, beset between the ribs with several irregularly arranged glands, truncate at the apex; pappus uniseriate; setæ equally long, reddish, shortly hispidulous, persisting a long time. On sparingly bushy hills between Tanderaxique and Calumguembo; fl. and fr. Sept. 1854. No. **3348**.

Golungo Alto.—A loosely-branched shrub, 3 ft. high, with whitish-liliac flowers. In thickets along the highway between Trombeta and Cabondo; fl. and young fr. Sept. 1854. No. **3349**. A shrub of 4 ft., much branched from the base; branches tomentose, rather erect; leaves especially the upper ones with large undulations so that they appear sinuous; involucres green, with obtuse scales densely ciliate with whitish hairs; corollas of a whitish-violet colour, rather fleshy,

tubular, the tube rather broad, inflated in the middle, the lobes of the limb rather long, acute and connivent at the apex ; nectaries cupuliform, rather fleshy, dentate at the mouth ; achenes 10-ribbed, nearly glabrous but beset with small glands scattered or in rows ; pappus uniseriate ; setæ thick, rather rigid, straight, thickened towards the apex, turning rufous in old age. In secondary thickets at Sange on the right bank of the river Cuango ; fl. and fr. beginning of Oct. 1855. No. **3350.** A small tree of 6 to 10 ft. or in secondary thickets only a shrub of 4 to 6 ft. ; branches patent ; flowers whitish, agreeably aromatic. By wooded thickets near Camilungo along the Ambaca road ; fl. and fr. July 1855. No. **3351.** A tree, 12 to 15 ft. high ; stem slender ; head widely spreading ; flowers lilac, fragrant ; achenes with few (3 or 4) angles, shortly hispid ; pappus uniseriate. About Sange, abundant ; fl. and fr. June and July 1855. No. **3357.** A tree, 6 to 15 ft. high ; trunk 4 in. diameter at the base, occasionally in the primitive forests attaining 6 in. ; branches erect-patent ; flowers very numerous, whitish ; achenes a little bent, hispid (glandular) ; pappus uniseriate ; setæ rather rigid, hispid. In comparatively open thickets near Sange, very abundant ; fl. and fr. end of July 1856. No. **3358.** A tree in the courtyard of the residency, Golungo Alto ; fl. and fr. July 1855. No. **3359.** A tree of 10 to 15 ft., rarely reaching 20 ft. ; trunk straight, bare below, much branched above forming a spreading nearly globose head completely covered with white flowers. At the borders of primitive forests throughout the district ; fl. and fr. beginning of Aug. 1856. No. **3360.** A shrub sometimes erect, in other cases quasi-scandent with its branches elongated, bare at the base, divaricate, somewhat climbing among other shrubs or tall grasses ; flowers whitish but the corymbs appearing pale-yellow on account of the yellowish involucral scales. In thickets and beds of tall reeds near Quibixe ; fl. and fr. Sept. 1855. No. **3361.** In the village (of Sange), close to the Tacula (cf. *Pterocarpus tinctorius* Welw. Herb. No. 1867), and *Intsia cuanzensis* O. Kuntze ; fl. and fr. 30 Oct. 1855. No. **3362.** A low tree with numerous white flowers and more or less ovate leaves not auriculate at the base. Sange, fr. Sept. 1857. Coll. Carp. 661. A small sufficiently elegant tree of 15 to 20 ft. high, or in the secondary woods only 10 to 12 ft. high ; trunk straight, slender ; bark very bitter ; head ovoid-hemispherical ; leaves membranous, caducous ; flowers very abundant, corymbose-paniculate, white. In forests ; fr. Aug. 1857. Coll. Carp. 662.

Cazengo.—A shrub 6 to 8 ft. high, shaped like a tree ; flowers pale-lilac, almost white. On stony hills on the left bank of the river Luinha, about 2000 ft. alt. ; fl. and fr. end of June 1855. No. **3356.**

Pungo Andongo.—A shrub-like little tree but with a single trunk, frondose at the apex ; flowers from whitish to lilac. In hot stony thickets about Caghuy and Luxillo, sporadic ; fl. and fr. end of May 1857. A remarkable form on account of the setæ of the pappus being very thick, and at the apex clavate-thickened ; in this respect No. **3350** in Golungo Alto approaches this form. The young leaves are tawny-velvety. No. **3353.**

This is the plant mentioned by Welwitsch, Apont. p. 586, n. 34, where it is described as remarkably ornamental and well worth cultivating. The Molúlus furnish a tonic, bitter bark, and are in frequent use in cases of fever and diarrhœa. (See Welwitsch, Apont. p. 548 under n. 84.) The specimens associated here under this name comprise several different forms which perhaps will subsequently require to be arranged under distinct subspecies. Welwitsch in a note remarks

that the name Molûlu is a collective one of three or four species of elegant bushes with white fragrant flowers belonging to Compositæ, and that the flowers furnish abundant food for bees. The word is derived from the root *lulu* of the verb *cululu*, to taste bitter.

28. **V. amygdalina** Delile, Cent. Pl. Meroë, p. 41 (1826); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 284.

Vernonia sp. Ficalho, Pl. Uteis, p. 206 (1884).

Island of St. Thomas.—A small tree or an arborescent shrub, with a medicinal bitter root and purple corollas. In mountainous places at the outskirts of the forest at Monte Caffé, between 1500 and 2000 ft. alt. Local name "Libó"; fl. and fr. Dec. 1860. No. **3265.**

29. **V. mumpullensis** Hiern, sp. n.

Rootstock thick, woody, branched, decumbent and descending; stems several, erect or ascending, simple or nearly so, sulcate-striate, more or less woolly with soft whitish curly hairs, rather slender, 5 to 8 in. high, leafy; leaves alternate, oval or oblong, obtuse at both ends, sessile, entire or repand, somewhat pubescent with soft whitish hairs chiefly beneath at the base and along the margin and nerves, minutely punctulate, $\frac{3}{4}$ to $1\frac{3}{4}$ in. long by $\frac{1}{4}$ to $\frac{3}{4}$ in. broad; capitula sub-hemispherical, many-flowered, $\frac{2}{3}$ to 1 in. in diameter, terminal, solitary or two together; peduncle $\frac{1}{4}$ to 1 in. long, densely pubescent; involucral bracts pluriseriate, bright straw-coloured, pubescent and scattered with little glands outside, glabrous inside, mostly apiculate; the lips sometimes spreading; the outer ones lanceolate short: the inner ones continually longer; the innermost linear-oblong, persistent, $\frac{2}{3}$ in. long; flowers purple; corolla about $\frac{1}{2}$ in. long, narrowly tubular, scattered with minute glands outside, not much dilated above, rather shortly 5-lobed; lobes narrowly lanceolate-oblong; anther-base sagittate; style-branches puberulous, tapering (in one case 3); achenes $\frac{3}{16}$ in. long, unequally 10-ribbed, irregularly quadrangular, glabrous on the ribs except the base, somewhat hispid and glandular between the ribs, with a broad basal callus; pappus $\frac{1}{3}$ in. long, golden-yellow, biseriate; the outer row short, all the setæ scabrid-hispidulous.

Huilla.—In bushy pastures submitted to burning in winter, near Mumpulla: fl. Oct. 1859. No. **3343.**

Nearly related to *V. monocephala* Harv.

The description is taken from three specimens which had evidently sprung from an old burnt stock, and which possibly do not represent the normal conditiou of the species when allowed to grow up to its full height.

30. **V. orchidorrhiza** Welw. ms. in Herb., sp. n.

A nearly glabrous, pale, yellowish-green, glossy herb, 4 to 10 in. high; rhizome tuberous, fasciculate, the tubers suggesting those of an orchis but their base produced into a descending stout fibre; stems several, erect, straight, simple, glabrous below, sometimes sub-obsoletely tomentose towards the apex, slender, fragile, leafy throughout; leaves alternate, narrowly linear, crowded, directed upwards, rather thick, glabrous, glisten-

ing with minute sessile glands, entire, pointed, sessile, ¼ to 1 in. long; capitula homogamous, many-flowered, campanulate-hemispherical, solitary, terminating the stems, erect; involucral scales triseriate, nearly glabrate or puberulous in parts, the outer ones subfoliaceous narrow linear not contiguous, the middle ones scarious-subcoriaceous broader subacute or broadly pointed usually with a patch of almost obsolete felt near the apex, the inner ones longest obtuse somewhat crisp and with a red patch about the apex; corollas violet-purple or deep-violet, nearly glabrous; the tube elongated, narrow, abruptly dilated into an urceolate-campanulate 5-cleft limb; the lobes narrow, thinly glandular outside; anthers included, sagittate scarcely caudate at the base, furnished at the apex with a straight lanceolate rather obtuse appendage; filaments nearly glabrous; style subcylindrical, glabrous from the base to the middle, thence towards the apex plainly dilated and as well as the elongated exserted branches densely pubescent; achenes cylindrical-obpyramidal, densely and finely pilose, 10-ribbed, more densely pilose along the ribs and glandular between them; basal callus very short, subobliique; apical areola broad nearly flat furnished in the centre with a mucroniform or thinly conical nectary; pappus biseriate, rigid, straw-coloured; the setæ of the inner row exceeding the corolla-tube, thick, densely hispid, very brittle, caducous; those of the outer row half as long, hispidulous, more acute and persisting longer; receptacle flat, marked with non-confluent areolæ.

Huilla.—On rather dry sparingly bushy hills near Lopollo, at an elevation of 5000 ft.; rather rare and seen nowhere else; fl. and fr. Nov. 1859. No. **3988**.

31. **V. Macrocyanus** O. Hoffm. in Henr. Bol. Soc. Brot. xiii. p. 20 (1896).

Macrocyanus Welw. ex O. Hoffm., *l.c.*, p. 21, and in Herb.

Huilla.—A herb, with a woody perennial several-headed rootstock, stemless or the 2- to 3-headed stem scapiform; capitula broad, homogamous; involucral scales in 3 or 4 rows, broadly lanceolate, imbricate, rather lax, ciliate on the margin with slender short very dense prickles, the inner scales longer than the outer; corolla deep-blue, deeply 5-cleft; the tube very long, filiform; the lobes narrow, bearded at the apex with a crest of short hairs, subcucullate; anthers acutely appendaged at the apex, with longer ciliate-fimbriate or occasionally lacerated appendages at the base; style somewhat dilated below its division into branches and then hispidulous, with the branches very long rather flat inside and puberulous-hispidulous round the outside; achenes obcuncate, narrowed at the base, truncate at the apex, with several ribs, densely hispid all round (or very nearly glabrous); pappus in several rows; the setæ rigid, hispidulous, persisting a long time. On the wooded sunny declivities of hilly pastures near Catumba and towards Ohay, not at all abundant; fl. and nearly ripe fr. Jan. 1860. No. **3883**. Flowers blue. In the hilly pastures of Catumba, very rare because often died down; fl. and young fr. Jan. 1860. No. **3884**. In pastures with low bushes on the right bank of the river of Lopollo; fl. and young fr. Dec. 1859. No. **3985**.

Var. **ambacensis.**

A perennial herb; rootstock thick, woody, several-headed, more or less woolly about the apex; leaves radical, oblanceolate, rounded or shortly pointed at the apex, wedgeshaped to an attenuate shortly petiolate base, membranous, glabrous, erect, entire or with a few minute or distant teeth, 3 to 7 in. long (including the petiole) by $\frac{3}{5}$ to $1\frac{1}{2}$ in. broad; scapes numerous, rather thick, erect or ascending, glabrous, 10 to 18 in. high; capitula thick, cylindrical-oblong, homogamous, about $1\frac{1}{2}$ in. in diameter, many-flowered, solitary; corolla deep-blue, with an elongated filiform tube, elongate-campanulate deeply 5-cleft limb, and linear-acuminate lobes glandular-bearded outside at the apex; style filiform, thickened and hispid below its division; achene (not quite ripe) linear-oblong, angular, subglabrous or sparingly hispidulous; pappus pluriseriate, $\frac{1}{2}$ in. long, with rigid straight hispidulous brown-rufous setæ.

Ambaca.—In sandy bushy forests largely composed of *Cussonia angolensis* (Welw. Herb. No. 480), near Zamba towards the river Lucala, rather rare; fr. and one specimen only in fl. Oct. 1856. No. 3892.

This species apparently belongs to the section *Lachnorhiza*.

32. **V. præcox** Welw. ex O. Hoffm., *l.c.*, p. 16.

V. violacea Klatt in Ann. Nat. Hofmus. vii. p. 99 (1892); non O. & H. (1873).

Golungo Alto.—A herb, 2 to $2\frac{1}{2}$ ft. or sometimes only a foot high; rootstock thick, fleshy, deformed, crowded with long fibres, perennial; stem erect, leafy below; leaves appearing mostly after the flowers; flowers violet-purple or red; corollas tubular, 5-cleft. In elevated bushy pastures in Sobato Bumba, on the herbaceous declivities of Alta Queta, rather rare; fl. and fr., the leaves destroyed by fire, Oct. 1855; in similar places after the burnings, fl. and fr. end of August 1855; in thin secondary thickets grown up after the burnings, fl. and fr. end of Sept. 1855. No. 3330.

33. **V. chthonocephala** O. Hoffm., *l.c.*, p. 17.

Golungo Alto.—A dwarf perennial herb, with the habit of *Saussurea pygmæa* Spr.; rootstock woody, many-headed; stems very short, beset with whitish-rufous woolly hairs; flowers purplish verging on violet-blue, produced in spring before the leaves soon after the burning of the plains and presaging the coming rains; capitula cylindric-ovoid, thick, singly on short scapes. On elevated rather dry slopes amongst short herbage near the summit of the mountains of Serra do Alto Queta, at Carengue; seen nowhere else; fl. August to Jan. 1855-7. In consequence of the burning of the country by hunters and shepherds, the leaves of this plant are rather rarely found. No. 3886.

34. **V. vaginata** O. Hoffm., *l.c.*, p. 14.

Huilla.—A perennial herb, with several stems, ascending, 1 to $1\frac{1}{2}$ ft. high, clothed in all parts with a dense white felt; corolla-lobes three times as long as the tube; anthers with long tails; style cylindrical, thickened and patently pilose at its bifurcation; the branches

elongated, pilose along the inner face; achenes turbinate, densely silvery-pilose; pappus pluriseriate, white, setose. Habit of some robust *Elephantopus*. In the rather dry wooded pastures of the Monino, abundant; fl. and fr. end of Feb. 1860. Collected at the war-time. No. 4006.

35. **V. lampropappa** O. Hoffm., *l.c.*, p. 14.

Pungo Andongo.—No notes. Fl. No. 3291.

This and the two next species constitute a new section of the genus characterized by the segments of the pappus being more or less flattened and subpaleaceous instead of setiform and called Lampropappus by O. Hoffmann, *l.c.*

36. **V. eremanthifolia** O. Hoffm., *l.c.*, p. 15.

Huilla.—At the outskirts of Panda forests (cf. *Berlinia* and *Brachystegia*) between Eme and Lopollo; not yet in open fl. Feb. 1860. No. 3292. Flowers purple in the cleared thickets near Nene, beginning of June 1860; or pale-blue in the drier bushy places near Humpata, where it occurred sparingly and a few flower-heads in April 1860; fl. and fr. No. 3293.

37. **V. Britteniana** Hiern, sp. n.

A rigid, rather slender, subtomentose, erect, apparently shrubby herb; stem sulcate-striate, terete, leafy, purplish and subglabrate below, clothed above with a very short whitish felt; leaves alternate, oblong or oblanceolate, obtuse and subapiculate at the apex, gradually narrowed to a sessile base, denticulate or subrepand, yellowish-green and minutely scabrid above, whitish-tomentellous with a very short felt and black-punctulate beneath, 1 to $3\frac{1}{2}$ in. long by $\frac{1}{6}$ to $\frac{1}{2}$ in. broad; capitula campanulate-oblong, $\frac{1}{4}$ in. in diameter, sessile or subsessile, in clusters a few together arranged in a compound terminal rather lax corymbose or subhemispherical cyme about 6 in. in diameter; involucral scales pluriseriate, obtuse or apiculate, the outer ones shortly woolly; the inner ones longer, oblong, ranging up to $\frac{3}{8}$ in. long, with a short scarious rounded subglabrous apical appendage; corollas violet-coloured, $\frac{1}{2}$ in. long; tube rather abruptly widened above the pappus, shortly 5-lobed; lobes lanceolate; anthers exserted, acutely produced at the base into long tails, shortly produced at the apex; style-branches exserted, puberulous, tapering, curved; achenes broadly oblong, somewhat compressed, 10-ribbed, shortly hispid; pappus sub-biseriate, $\frac{3}{10}$ in. long, rather tawny, setæ rather compressed, minutely setulose; receptacle nearly flat, areolate.

Huilla.—In wooded places amidst shrubs between Eme and the lake of Ivantâla, rare; fl. and fr. April 1860. No. 3281.

Nearly related to *V. cardiolepis* O. Hoffm., but more slender, narrower in its leaves and flower-heads, and rather woolly involucral scales.

38. **V. cardiolepis** O. Hoffm., *l.c.*, p. 12.

Pungo Andongo.—An erect herb, 2 to 3 ft. high, with azure-bluish flowers. In the Panda forests of Candumba near Condo, abundant; fl. and young fr. beginning of March 1857. No. 3280.

39. **V. temnolepis** O. Hoffm., *l.c.*, p. 11.

Huilla.—A herb, 2 to 3 ft. high, with the habit of a *Centaurea*; rootstock woody, few-headed; stems several, ascending-erect, leafy below and with leaves at the divaricate divisions of the corymbose apex; leaves vertical; capitula homogamous, many-flowered; corollas tubular, elongate-funnelshaped, rather deeply 5-cleft, pale wine-red; the lobes broadly linear rather obtuse and spreading, hooded-fleshy at the apex; anthers hastate; filaments glabrous; style relatively thick, stout, sparingly or scarcely hispidulous and a little thickened below the division; the branches long, attenuate, flattish on the inner side, hispidulous round the outer side; achene compressed, densely setaceous-pilose, with a callus at the base, truncate at the apex, the areola usually excentric; pappus rigid, rough, in 2 or 3 (?) rows of straight pilose-setulose setæ more or less cohering at the base and a little thickened towards the apex. On rough bushy hills between Nene and Humpata; a few specimens in fl. and young fr. April 1860. No. **3273.**

40. **V. ulophylla** O. Hoffm., *l.c.*, p. 13.

Golungo Alto.—A herb, 3 to 4 ft. high, suffruticose at the base, with the habit of a *Centaurea* or rather of a *Catananche*; stem strictly erect; appendages of the involucral scales rigid, white, scarious; corollas tubular, ventricose in the middle, blue or azure-bluish; achenes narrowed, $\frac{1}{8}$ in. long; setæ of the pappus paleaceous, biseriate, very brittle. On rather dry declivities of Sobato de Bumba and de Mussengue; fl. and fr. Feb. 1856. No. **3279.** In sunny bushy places near Menha-lula; fl. and fr. beginning of July 1855. No. **3279***b*. A herb, $2\frac{1}{2}$ to 4 ft. high, apparently annual; stem thick, hard, strictly erect; leaves green above, pale-tawny and felted beneath; capitula resembling those of a *Catananche*, with whitish scales; corollas pale-blue. At Menha-lula, in Sobato de Mussengue; fr. March 1855. Coll. Carp. 682.

Var. **Hoffmanniana.**

V. guineensis, forma capitulis brevius pedunculatis, O. Hoffm., *l.c.*, p. 12; non Benth.

An erect, perennial, robust herb, with somewhat the habit of a *Carthamus*, 1 to 2 ft. high or more; stem clothed with a short pallid or somewhat tawny or ferruginous felt, terete below, obtusely tetragonal above, branched towards the apex at the inflorescence, leafy; leaves alternate, directly upwards, obovate-oblong or oblanceolate, rounded and slightly emarginate or sub-apiculate at the apex, narrowed to or towards the sessile or subsessile base, thinly sub-coriaceous, rigid, yellowish-green and scabrid above, softly velvety and subrufous or paler beneath, $1\frac{1}{2}$ to $4\frac{1}{2}$ in. long by $\frac{1}{2}$ to $1\frac{1}{2}$ in. broad, crenate-serrate with obtuse or rounded and sub-apiculate teeth except towards the base; capitula broadly campanulate, many-flowered, $\frac{1}{2}$ to $\frac{3}{4}$ in. in diameter (exclusive of the corollas), mostly subsessile or on tomentose pedicels ranging up to an inch long, arranged in terminal and subterminal erect small pedunculate cymes, often forming a compound terminal somewhat leafy cyme $2\frac{1}{2}$ to 5 in. in diameter, or rarely solitary and terminal; bracts linear, tomentose; involucral scales in about 6 rows, imbricate, linear or oblong, woolly

over the exposed part of the back or at least outside the appendages, lower part glabrous and glossy inside; the outer ones linear or spathulate, like the bracts, $\frac{1}{6}$ to $\frac{1}{4}$ in. long; the inner ones longer and broader, with adpressed or revolute appendages; the innermost ones linear-oblong $\frac{1}{2}$ to $\frac{3}{4}$ in. long; the appendages mostly erect or in flower reflexed, thin with narrowly scarious margins, $\frac{1}{8}$ to $\frac{2}{5}$ in. long, ovate or deltoid, terminal, acute or rounded or shortly apiculate, more or less woolly at the back; corollas bluish, occasionally blue, exceeding the involucral scales, $\frac{2}{3}$ to $\frac{3}{4}$ in. long, narrowly tubular, in the upper part narrowly funnel-shaped and 5-cleft, the lobes lanceolate; anther-tube $\frac{1}{3}$ part exserted; anthers with lanceolate appendages at each end; style hispidulous in the upper part, the branches exserted, puberulous, rather elongated, spreading, incurved, tapering: achenes (young) $\frac{1}{8}$ in. long, obovate-oblong, somewhat compressed, fuscous, obscurely 8- to 10-ribbed, closely setulose with short upturned pallid hairs; pappus rufous, $\frac{2}{3}$ in. long, pluriseriate; setæ unequal somewhat flattened, slightly barbellate-ciliolate.

Pungo Andongo.—In rocky glades in the forest, between Calunda and Mangue, sporadic; fl. and young fr. March 1857. No. **3278**.

This variety differs from *V. guineensis* Benth. in Hook. Niger Fl. p. 427 (1849), O. & H. in Oliv. Fl. Trop. Afr. iii. p. 285, the type-specimens of which are in the British Museum herbarium, by the shape and margin of the leaves, as well as by the inflorescence; to the latter species Hoffmann, *l.c.*, unites *V. firma* O. & H., *l.c.*, p. 290, which is founded on Schweinfurth's specimens, n. 3153, from Niamniam-land, and which has broader leaves with an obsolete tomentum beneath; the specimens collected by Scott Elliot nn. 4737, 4842 and sent out from the Kew herbarium, each with the name of *V. firma* attached, perhaps belong to different species; the latter has foliage and inflorescence rather of *V. guineensis* Benth., and the former rather the foliage of *V. ulophylla* var. *Hoffmanniana*.

41. **V. sclerophylla** O. Hoffm., *l.c.*, xiii. p. 13.

Pungo Andongo.—A perennial suffruticose erect herb, 3 to 4 ft. high; leaves subcoriaceous, rather rigid; involucral scales subscarious, whitish, coriaceous at the base, imbricate, spreading; flowers azure-blue or bluish. In the more elevated secondary thickets of the præsidium, not uncommon, fl. end of Feb. 1857; also in bushy places amongst tall grasses within the præsidium; abundant, fl. and fr. beginning of May 1857. No. **3277**.

42. **V. rigidifolia** Hiern, sp. n.

An erect stiff herb, $2\frac{1}{2}$ ft. high or more; stem simple up to the inflorescence, subterete below, sulcate-striate, puberulous, not scabrid, uniformly leafy; leaves alternate, oblanceolate or obovate, subobtuse at the apex, wedge-shaped to the attenuate scarcely petiolate base (or with a narrowly-winged petiole), very rigid, chartaceous, very scabrous otherwise glabrous above, obsoletely tomentose beneath, dentate, $1\frac{1}{2}$ to 6 in. long by $\frac{1}{3}$ to $1\frac{1}{2}$ in. broad; lateral veins widely spreading, about 10 on each side, slender, along the bottom of depressions on the upper face, raised on the lower face; capitula sub-hemispherical, $\frac{1}{2}$ to $\frac{3}{4}$ in. in diameter, many-flowered,

solitary or a few together on short pedicels in axillary and compound erect terminal pedunculate narrow cymes; bracts leaflike smaller than the leaves; involucral scales pluriseriate, oblong or linear, obtuse, somewhat woolly on the back, straw-coloured and rigid below, $\frac{1}{5}$ to $\frac{2}{5}$ in. long, terminating in a thinner dark-coloured spreading or reflexed ovate appendage; achenes $\frac{1}{8}$ in. long, obovoid-oblong, with about 8 pallid-hispid ribs; pappus slightly reddish, almost straw-coloured; the setæ unequal, slightly compressed, ciliolate-barbellate.

Golungo Alto.—No notes. Fr. No. **3698.**

43. **V. filipendula** Hiern, sp. n.

An erect perennial rigid herb, sometimes only 8 in. high, in other cases 1 to 3 ft. high; rootstock thick, woody, giving off long fibres some of which develop in their course at the distance of 1 to 2 in. an ovoid subligneous tuber more than an inch long and $\frac{1}{3}$ to $\frac{1}{2}$ in. thick; stems simple, striate, hispidulous-tomentellous, subterete below, obtusely angular above, leafy except the base; leaves alternate, obovate-oblong or oblanceolate, subobtuse and shortly apiculate at the apex, wedge-shaped to the sessile or subsessile base, thinly and rigidly coriaceous, scabrid, and hispidulous, yellowish-green above, rather paler and more densely hairy beneath, 1 to 3 in. long, by $\frac{1}{4}$ to $\frac{3}{4}$ in. broad; denticulate or subrepand; capitula campanulate-hemispherical, many-flowered, $\frac{5}{8}$ to $\frac{7}{8}$ in. in diameter, on scabrid hispidulous or somewhat woolly pedicels of $\frac{1}{3}$ to 2 in. long in about a 2-headed terminal inflorescence; pedicels with a foliaceous bract at the base and some linear hairy bracteoles at the apex about $\frac{1}{4}$ in. long; involucral scales pluriseriate, linear or oblong, mostly with a purplish ovate thinner brittle adpressed obtuse or subobtuse minutely apiculate appendage, $\frac{1}{4}$ to $\frac{1}{2}$ in. long, the outer ones the shorter; corollas bluish-purple, $\frac{5}{6}$ in. long when extended, narrowly tubular, gradually widened to the upper shining glabrous often spreading shortly 5-cleft upper part; the lobes lanceolate, subacute; anther-tube with rather finely-pointed tails at the base and lanceolate hyaline appendages at the apex; style-branches rather long, puberulous, pointed, the upper part exserted; young achenes short, dusky, marked with about 10 longitudinal rows of short whitish hairs; pappus straw-coloured, pluriseriate, setose; the setæ somewhat flattened, ciliolate-barbellate, the other ones the shorter.

Huilla.—In pastures among tall herbs, at Catumba; fl. and young fr. April 1860. No. **3275.**

44. **V. benguellensis** Hiern, sp. n.

An erect robust rigid herb, 3 ft. high; stem subterete, striate-sulcate, puberulous, branched slightly scabrid and leafy above; leaves alternate directed upwards and often folding longitudinally inwards, elliptical, more or less narrowed at both ends, not very acute, apiculate, subsessile, thinly and rigidly coriaceous, scabrid with short thick rigid pointed hairs and minutely scaly above,

rather tomentose with pallid or whitish soft hairs often obsoletely so and minutely pitted beneath; 2 to $4\frac{1}{2}$ in. long by $\frac{1}{3}$ to 1 in. broad (the lower ones not seen), denticulate with small apiculate teeth; capitula hemispherical-globular, many-flowered, $\frac{3}{4}$ to $1\frac{1}{4}$ in. in diameter, on puberulous or scaberulous bracteate peduncles of about an inch long singly terminating the ultimate branches of the stem and forming together a leafy rather lax terminal subcorymbose cyme or a few together on unequal pedicels; bracts sublinear, acute, several near together and near the base of the capitulum and supplementing the involucral scales, $\frac{1}{3}$ to $\frac{1}{2}$ in. long, scaberulous or puberulous; involucral scales pluriseriate, lanceolate oblong or nearly oblong or linear, pointed at the apex, puberulous or nearly glabrous outside, glabrous and shining inside, adpressed lower part rigid straw-coloured, upper part appendicular thinner purplish $\frac{3}{8}$ to $\frac{3}{4}$ in. long; the outer ones the shortest and nearly continuous with the upper bracts of the peduncle or pedicel; corollas violet-coloured or bluish-purple, about an inch long when extended, scattered with minute glands outside, lower part of the tube very slender, $\frac{2}{3}$ in. long, rather abruptly widened at the apex into the 5-cleft spreading upper part: the lobes lanceolate, subacute; anther-tube sagittate at base, with comparatively short tails; apical appendages ovate; style-branches puberulous, tapering, spreading and incurved, comparatively short; achenes $\frac{1}{7}$ in. long, shortly and densely hispid with short upward pallid hairs arranged in about 8 longitudinal rows; pappus about $\frac{1}{2}$ in. long or a little longer, pluriseriate, setose; the setæ somewhat flattened, straw-coloured, ciliolate-barbellate, outer rows the shorter.

Huilla.—In wooded meadows by the lake of Ivantâla; fl. and fr. Feb. 1860. No. **3276**. Sporadic; fl. and young fr. beginning of March 1860. A form with smaller heads and narrower leaves tomentose beneath. Perhaps a distinct species. No. **3276***b*.

Nearly related to *V. mossambiquensis* O. & H.

45. **V. glaberrima** Welw. ex O. Hoffm. p. 15.

Golungo Alto.—An elegant herb; rootstock perennial, woody: stems ascending, densely cæspitose; flowers violet-coloured. On the more elevated declivities of the mountains of Sobato de Bumba; fl. and fr. Oct. 1855. No. **3327**. A perennial herb; rootstock woody, many-headed; stems numerous, erect or ascending, acutely angular; branchlets erect, thin; leaves coriaceous, rather rigid, rather glossy on both faces; capitula homogamous; flowers lilac; corolla tubular, whitish-rosy, ventricose, 5-cleft at the mouth, with connivent lobes; the tube of the anthers deep-lilac, included; style bifid or trifid, with the lobes exserted and arched. On elevated declivities of the mountains of the central Queta; fl. and fr. beginning of Sept. 1856. No. **3328**. In bushy hilly places in Sobato de Bumba after the burnings (Queimadas); fr. No. **3329**.

46. **V. conferta** Benth. in Hook. Niger Fl. p. 427 (1849); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 294; Ficalho, Pl. Uteis, p. 206.

V. arborea Welw. ex O. Hoffm. in Bol. Soc. Brot. x. p. 172 (1893).

Cazengo.—A tree, usually from 15 to 20 ft. high, occasionally higher; the young stem simple, crowned at the apex with a head of very large leaves; the older stem sparingly branched, with thick elongated distantly-leafy branches; panicles terminal, white-flowered, 1½ to 2½ ft. long; capitula subsessile, arranged in dense rows along the branches of the panicle. In the more elevated primitive forests of Serra de Muxaûla; fl. and fr. June 1855. No. **3259**.

Golungo Alto.—A tree, 20 to 25 ft., even 35 ft., with a trunk 5 to 10 in. in diameter at the base, sparingly and thinly branched; bark whitish or grey; head lax; branches elongated, arched upwards, sparingly twiggy, subterete, tomentose when young; the young trees simple, crowned with a palm-like head of gigantic fasciculate leaves resembling an immense cabbage; leaves alternate, shortly petiolate, very large, ranging up to 2 and 4 ft. long by 1 and 1½ ft. broad, sinuate-lobed, rigid, with thick nerves, fasciculate at the apex of the branches and branchlets; capitula homogamous, obconical, rather small, arranged in racemose pyramidal panicles 1 to 2 ft. long, 15- to 20-flowered; involucral bracts pluriseriate, loosely imbricate, rigid, pubescent, the outer ones very short, rather thick, spreading, rather obtuse; the inner ones elongated, erect, oblong-linear, shortly acuminate; corolla whitish with 5 equal ovate-lanceolate lobes much shorter than the long tube and with the throat scarcely or but little widened; anthers exserted, appendiculate at the apex, acutely sagittate-caudate at the base; stigmas rather long, obtusely subulate, far exserted, recurved, inflected or spirally twisted outwards, hispidulous or pubescent all round; achenes obconic-cylindrical, subcompressed, marked with a few ribs, glabrous or nearly so, truncate at the apex, with a callus at the base a little narrower than the achene and much shorter; pappus uniseriate, many times longer than the achene; the setæ crowded, nearly as long as the corolla, equal among themselves, slender, rather rigid, very densely, very delicately serrulate-setulose, whitish; receptacle elevated, areolate. In the primitive forests among the mountains of Serra de Alto Queta; fl. July and Aug. 1855, fr. Sept. 1855, sporadic. Native name "Quipuculo cafele" (small Quipuculo), or "Quipûcolo." No. **3259***b*. A very beautiful tree of moderate size, in youth resembling a palm, from a long distance much like in habit *Anthocleista nobilis* G. Don (which is also called "Quipucalo"); trunk 6 to 10 in. in diameter; branches and leaves, etc., clothed with a more or less rufous tomentum; flowers whitish, arranged in gigantic terminal ovoid-pyramidal panicles. In the elevated forests of Sobato Quilombo and Bumba; fl. May and Dec. No. **3269**. A tree, 15 to 20 ft. high; trunk straight, sparingly branched, when young resembling a palm with its broad unlobed leaves 2 to 2½ ft. long by 4 to 6 in. broad; flowers whitish, pyramidal-paniculate. In the elevated primitive forests not uncommonly attaining 25 or 30 ft. in height; fr. July 1857. Coll. Carp. 685.

According to a note of Welwitsch, the trunk of this tree attains a foot in diameter, but only so thick in the primitive forests on the farther side of the river Zenza. Another native name is "N-tende." It occurs also in the district of Dembos; see Welw. Synopse Explic. p. 10. n. 17 (1862).

47. **V. Thomsoniana** O. & H. ex Oliv. in Trans. Linn. Soc. xxix. p. 91 (1873) and in Oliv. Fl. Trop. Afr. iii. p. 295; O. Hoffm. in Bol. Soc. Brot. xiii. p. 16 (1896).

Ambaca.—A herb, 3 to 4 ft. high, with whitish flowers verging on

a pale-violet colour. On grassy hills on the left bank of the river Caringa ; fl. and fr. June 1855. No. **3255**.

Golungo Alto.—A herb 2½ to 3½ ft. high or more, with whitish-lilac flowers. In hilly places by the road towards Sobato de Mussengue. fl. and fr. July 1855. No. **6722**. A shrub of 6 to 8 ft. shaped like a small tree, with spreading branches and flowers of a whitish-violet colour. In the eastern Queta ; fl. and fr. July 1856. Native name "N-dôlo." No. **3256**. An evergreen little shrub, 1 to 1½ ft. high, densely cæspitose, with coriaceous shining leaves and whitish flowers. On the highest ranges of Sobato de Quilombo ; fr. March 1855. Probably this species. Coll. Carp. 681.

Pungo Andongo.—In primitive woods a little tree 6 to 10 ft. high with a straight slender trunk, or in secondary woods a shrub with numerous stems ; bark grey, very bitter ; branches erect-spreading ; branchlets patent ; capitula several-flowered, very densely corymbose ; corollas from whitish to lilac, much liked by bees, though not very fragrant. Between the præsidium and Sansamanda ; fl. and fr. beginning of June 1857. Native name sometimes "Molûlu," or more correctly "N-dolo." No. **3257**.

The name "Molûlu" is also applied to *V. senegalensis*, *V. podocoma*, and *V. auriculifera* ; and the last is also called "N-dolo."

48. **V. podocoma** Schultz Bip. ex Schweinf. & Aschers. in Schweinf. Fl. Æthiop. p. 287 (1867) ; O. & H. in Oliv. Fl. Trop. Afr. iii. p. 296.

Bumbo.—Flowers whitish-lilac. In willow-beds composed of *Salix Sapsaf* Forsk. (Welw. No. 6332*b*), by streams near Chão da Xella, abundant ; fr., most of the flowers having fallen, Oct. 1859. No. **3263**. Flowers prettily violet-coloured ; (fl. and) fr. Oct. 1859. No. **3267**.

49. **V. auriculifera** Hiern, sp. n.

A small tree, 8 to 20 ft. high or in secondary woods only a shrub of 6 to 8 ft., but mostly with a single trunk, 1 to 3 in. in diameter at the base, and a leafy branched head at its apex ; branches spreading, sparse on the lower part of the plant, crowded at the head, gradually shorter, pithy, glabrescent ; branchlets hoary-tomentellous towards the apex ; leaves alternate, elliptical or ovate-oval, somewhat acuminate or pointed at the apex, wedge-shaped or nearly rounded or reniform-auriculate at the base, membranous (mostly destroyed by insects), the adult ones nearly glabrate, ranging up to 15 in. long by 6 in. broad, denticulate ; the teeth tipped with the continuations of ramifications of the venation ; midrib very prominent on the under face ; lateral veins about 12 to 15 on each side, spreading at a wide angle ; petioles ranging up to 2 in., somewhat dilated and clasping at the base, with two deciduous axillary horseshoe-shaped reniform stipular auricles ⅓ to ½ in. long ; flowers solitary in each involucre, whitish-lilac ; involucre oblong, ¼ in. long, sessile or subsessile, densely and sub-umbellately crowded on the ultimate branches of ample terminal corymbs ; bracteoles very small, hairy ; scales of the involucre imbricate often ciliolate, the outer ones shorter puberulous and obtuse, the inner ones elongated acuminate or apiculate subglabrous almost as long as the flower prettily

greenish soon spreading and easily breaking off; corolla tubular, gradually narrowing downwards, rather shorter than the anthers; lobes ovate, sub-acute; anther-base obtuse; style-branches exserted, puberulous, somewhat tapering, diverging and spirally curved downwards; nectary small, fleshy, annular, glabrous; achenes glabrous when young, afterwards thinly pilose, about 10-ribbed; pappus rigid, setose, nearly in one row, as long as the involucre, always white.

Golungo Alto.—In wooded situations throughout nearly the whole district. Between Trombeta and Cabondo; fl. and fr. Sept. 1854. Near Cacarambola July 1855, and by thickets abundantly, fl. and fr. 14 Aug. 1855. At Sange, June 1856. Native name "N-dolo"; by some erroneously called "Mululu." No. **3258** partly.

Cazengo.—In Mata de Cambondo; fl. and fr. June 1855. No. **3253** partly.

Huilla.—In wooded rocky parts of Humpata; not yet in fl. April 1860. In the absence of fl. and fr. the determination is doubtful. No. **3262**.

Nearly related to *V. myriantha* Hook. f., but differs by the 1-flowered involucres and by the presence of the auricles; see Scott Elliot in Journ. Linn. Soc. xxx. p. 84 (1894).

5. **HERDERIA** Cass.; Benth. & Hook. f. Gen. Pl. ii. p. 232.

1. **H. stellulifera** Benth. in Hook. Niger Fl. p. 425 (1849); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 298.

Sierra Leone.—Fl. and fr. Sept. 1853. No. **3519**.

Golungo Alto.—An annual herb 2 ft. high, or rarely biennial and then 3 ft.; corollas violet-red. In shady forests and in tall damp reed-beds along rivulets, at the spring of Capopa; fl. and fr. beginning of Jan. 1855. No. **3516**. In the primitive forests of Quisuculo in Sobato Bango; fl. and fr. April 1856. No. **3514**. An annual, rather erect, much branched herb, with the habit quite of an *Alsine*, and red corollas. In moist neglected places previously cultivated, near Sange, in the Bumba country; fl. and fr. May 1856. No. **3515**.

Ambaca.—An erect herb, 1 to 2 ft. high, with lilac-purple deciduous corollas. In moist places at the wooded outskirts of the mountains of Queta, near the river Moembege; fl. and fr. June 1855. No. **3517**.

Pungo Andongo.—An annual herb, with a slender usually quasi-scandent stem, and pallid violet-coloured corollas. Among tall grasses on the Calemba island in the river Cuanza; fl. and fr. March 1857. No. **3518**.

6. **ELEPHANTOPUS** L.; Benth. & Hook. f. Gen. Pl. ii. p. 237.

1. **E. scaber** L. Sp. Pl., edit. 1, p. 814 (1753); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 299.

Huilla.—A perennial herb, growing in a cæspitose manner, with the habit of the genus. In sunny wooded parts of the Monino, not uncommon; not yet in open fl. Feb. 1860. No. **3389**.

Prince's Island.—In wooded sunny places in the lower part of the island; fr. Sept. 1853. No. **3388**.

2. **E. Welwitschii** Hiern, sp. n.

An erect strigose-scabrid perennial herb, 2 to 4 ft. high, branched in the upper part; stem terete and with the branches

sulcate-striate, clothed with rather long whitish simple strigose-hispid hairs which arise from a thickened or bulbous hard persistent base; branches somewhat angular above; lower internodes shorter than the leaves, the upper ones longer; leaves alternate, oval-elliptical or the uppermost ones somewhat lanceolate, rather shortly narrowed to subacute apex, somewhat narrowed towards the rounded or obtuse base, toughly membranous, rigid, dark-green scattered with some hairs like those of the stem and marked with slender impressed venation above, canescent and densely hispid-pubescent beneath, 1 to 3 in. long by $\frac{1}{4}$ to $1\frac{1}{3}$ in. broad; the margin very narrowly revolute, minutely crenulate; petiole very short, broad, dilated and clasping at the base, pubescent-hispid; capitula narrowly ovoid-oblong, $\frac{3}{8}$ to $\frac{1}{2}$ in. long, somewhat angular or compressed, 4-flowered, silvery-strigose, sessile, arranged (in one instance) in a cluster of 1 in. in diameter containing 24 capitula which are grouped in 3 approximated subordinate subsessile clusters bracteate at the base, 2 lateral alternate and 1 terminal, containing 7, 7, and 10 capitula respectively; the bracts ovate or lanceolate, more or less equalling the capitula in length; the principal clusters broadly campanulate or sub-hemispherical, somewhat compressed, $\frac{3}{4}$ to 1 in. in diameter, terminal and axillary, on pedicels ranging up to $2\frac{3}{4}$ in. long or sessile and then axillary or lateral, the whole forming a compound somewhat leafy or bracteate ovoid terminal cyme 5 to 9 in. in diameter; in other instances the principal clusters consist of a greater or smaller number of subordinate clusters; involucral bracts 8 to 10, imbricate, from lanceolate to sublinear, $\frac{1}{4}$ to $\frac{3}{8}$ in. long, acute, silvery-strigose on the exposed part of the back, glabrous and shining inside, rigid, straight and erect or nearly so, the inner 4 or 5 longer and narrower than the rest, the outer ones somewhat cymbiform; corolla narrowly tubular, purple-blue; the tube $\frac{1}{8}$ in. long, very slender, glabrous; the limb about $\frac{1}{10}$ in. long, quadripartite; the segments sublinear, ciliate at the apex, unequal, $\frac{1}{12}$ to $\frac{1}{10}$ in. long; anthers shorter than the corolla-segments, obtuse at the base, narrowly lanceolate at the apex, easily separating, style rather exceeding the corolla-segments, puberulous, rather shortly bilobed; the lobes tapering; achenes about $\frac{1}{12}$ in. long, compressed, narrowing downwards, 10-ribbed, the ribs strigose with whitish hairs directed upwards, the intercostal spaces scattered with minute glands; pappus $\frac{1}{5}$ in. long, of a pallid-straw colour, consisting of 8 unequal compressed or slightly cymbiform narrow sub-paleaceous setæ, more or less ciliolate towards the acute apex.

Pungo Andongo.—In open bushy forests between Quibinde and Quitage; fl. and fr. March 1857. No. **3387**.

3. **E. angolensis** O. Hoffm. in Bol. Soc. Brot. x. p. 172 (1893).

Forma foliis valde rugosis, O. Hoffm., *l.c.*, p. 173.

Huilla.—A perennial herb, with the habit of the genus, and purple-blue flowers. On a coarse-sandy soil in open places scattered

with shrubs, between Lopollo and Jâu ; without fl. Feb. ; with fl. end of April 1860. No. **3390**. Flowers blue-purple ; at Ferrão da Sola ; fl. end of April 1860. No. **3391**.

Tribe II. Eupatoriaceæ.

7. **ADENOSTEMMA** Forst. ; Benth. & Hook. f. Gen. Pl. ii. p. 239.

Bulbopodium Welw. ex O. Hoffm. in Bol. Soc. Brot. xiii. p. 22.

1. **A. viscosum** Forst. Char. Gen. p. 90, t. 45 (1776) ; O. & H. in Oliv. Fl. Trop. Afr. iii. p. 299.

Verbesina Lavenia L. Sp. Pl., edit. 1, p. 902 (1753) ; non Roxb. *A. Lavenia* O. Kuntze, Rev. Gen. Pl. i. p. 304 (1891).

Golungo Alto.—An erect or ascending, annual herb, 2 ft. high ; lower leaves opposite, the upper ones alternate ; corolla milk-white or dirty-white. In neglected places after cultivation in Sobato Bumba, sparingly ; fl. and fr. May 1856. No. **3513**.

Huilla.—A herb, 2 to 4 ft. high ; stem cylindrical, erect, branched, relatively thick, not hollow ; branches reddish ; lower leaves opposite ; capitula homogamous ; involucral scales biseriate, oblique, directed towards the periphery, deep ; corolla white, 5-cleft, papillose outside ; anthers ecaudate, relatively very broad ; style filiform, rather fleshy, quite glabrous, divided about the middle into 2 gradually clavate thickened yellowish papillose branches ; receptacle sub-convex, naked ; nectary cupular, denticulate ; achene elongate-triquetrous, verrucose all round, obcuneate, truncate, the angles subacute, narrowed at the base and laterally seated on a little bulb ; pappus consisting of 3 paleæ. In elevated situations along the streams of Morro de Lopollo ; fl. and fr. Feb. 1860. No. **3700**.

Island of St. Thomas.—In wooded mountainous places, Monte Caffé, at 2000 ft. elevation ; fl. and fr. ; only one specimen, Dec. 1860. No. **3512**.

8. **AGERATUM** L. ; Benth & Hook. f. Gen. Pl. ii. p. 241.

1. **A. conyzoides** L. Sp. Pl., edit. 1, p. 839 (1753) ; O. & H. in Oliv. Fl. Trop. Afr. iii. p. 300.

Carelia conyzodes O. Kuntze, Rev. Gen. Pl. i. p. 325 (1891).

Sierra Leone.—Flowers pale-blue. In meadows and places of cultivation, near Freetown, abundant ; fl. and fr. Sept. 1853. No. **3396**.

Golungo Alto.—An erect annual herb, 1 to 3 ft. high, with beautifully blue florets. In herbaceous places at the outskirts of thickets, near Sange, abundant ; fl. and fr. middle of Jan. 1856. No. **3392**. Everywhere throughout the district ; fl. and fr. June to Aug. No. **3393**. At Dalatanda ; fl. and fr. June 1855. No. **3394**.

Island of Madeira.—In hilly places above Funchal, abundant ; fl. and fr. Aug. 1853. No. **3395**.

9. **EUPATORIUM** Tourn., L. ; Benth. & Hook. f. Gen. Pl. ii. p. 245.

1. **E. africanum** O. & H. in Oliv. Fl. Trop. Afr. iii. p. 301 ; O. Hoffm. in Bol. Soc. Brot. xiii. p. 22 (1896).

Golungo Alto.—A perennial herb, 2 or rarely 3 ft. high, with a woody rootstock and whitish flowers. On bushy declivities in Queta-Carengue, after the so-called Queimadas or burnings of the bush, tolerably abundant ; fl. and fr. Oct. 1855 and Jan. 1856. No. **3331**.

Huilla.—A widely cæspitose perennial herb, with heads of whitish flowers. Mumpulla; fl. and fr. Oct. 1859. No. **3345**.

These Nos. present considerable differences from one another as also from the type of the species; but these differences do not appear to be sufficient for specific separations; No. 3331 has its stem glabrate below and somewhat puberulous above, its leaves more or less narrowed towards the base and ranging up to 4 in. long by $1\frac{1}{2}$ in. broad, and on the barren shoots the leaves are opposite or subopposite; No. 3345 is a smaller plant, from 6 to 14 in. high, with leaves not or scarcely exceeding 1 in. long by $\frac{1}{2}$ in. broad, often subcordate at the base.

10. **WILLUGBÆYA** Necker, Elem. Bot. i. p. 82 (1790).

Mikania Willd. (1800); Benth. & Hook. f. Gen. Pl. ii. p. 246. *Carelia* A. L. Juss. ex Cavan. in Anal. Cienc. Nat. vi. (n. 18) p. 317 (Oct. 1803); nec Moehr., nec Less.

1. **W. scandens** O. Kuntze, Rev. Gen. Pl. i. p. 371 (1891) (*Willoughbya*).

Eupatorium scandens L. Sp. Pl., edit. 1, p. 836 (1753). *Mikania scandens* Willd. Sp. Pl. iii. p. 1743 (1800); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 301.

Golungo Alto.—By the road near Mussengue; fl. and fr. (with a gall) end of May 1855. No. **3397**. A suffruticose herb, climbing high and then hanging down; flowers white. In dense forests by thickets etc. in Sobato Mussengue; fl. Aug. 1855. No. **3398**. A herb or undershrub, climbing high and far; flowers white, fragrant with a sweet aromatic scent. In the forests of Quibixe at the banks of the river Cate; fl. and young fr., beginning of June 1856. No. **3403**. At Quibôlo; fl.-bud. July 1856. No. **3404**. An undershrub or rather a shrub, woody at the base, climbing to a great height and distance, frequently covering whole tracts of the forest with its whitish-yellow flower-heads, especially along the banks of streams and bottoms of valleys; it furnishes ample food for bees. In the primitive forests of the mountain Cungulungulo in Sobato Cabanga-Cacalungo, on the loftiest trees; fl. Feb. 1855. The flowers are really of a faint brimstone colour, and the tips of the involucral scales have the same colour; they thus make the dells of the forest, with the broad tops of such trees as *Albizzia*, etc., appear as if coated with powdered sulphur. No. **3405**. A suffruticose herb, climbing high and far, with whitish flowers. In both primitive and secondary forests, at the banks of the river Delamboa; fl. July 1856. No. **3406**. In valleys, abundant; fl. Feb. 1855. No. **3407**.

Huilla.—Flowers yellowish. In bushy wooded mountainous places between the lake of Ivantâla and Quilengues; fl. Feb. 1860. No. **3399**. A tall climbing undershrub, with leaves velvety beneath, very hirsute peduncles, and white fragrant flowers. In the more elevated wooded parts of the Monino, in the Lopollo country; fl. beginning of April 1860. No. **3400**. Climbing high, with white flowers. In *Parinari* forests; fl. Dec. 1859. No. **3401**.

Island of St. Thomas.—A scandent undershrub with lilac-whitish flowers. In wooded mountainous parts of Monte Caffé; fl. and fr. Dec. 1860. No. **3402**.

Tribe III.—Asteroideæ.

11. **PSEDNOTRICHIA** Hiern in Journ. Bot. xxxiv. p. 289, t. 388A (August 1898).

Capitula homogamous, disciform, many-flowered; involucre subglobose in bud, campanulate-hemispherical in flower and fruit; involucral scales subequal, subuniseriate, with narrowly membranous margins; receptacle naked, hemispherical, foveolate-areolate; flowers hermaphrodite, all fertile; corolla tubular, equally 5-cleft; anthers shortly produced at the apex into lanceolate appendages, obtuse and ecaudate at the base; style-branches short, straight, or slightly curved, somewhat compressed, not tapering, very blunt, but each with deltoid-lanceolate or lanceolate-subulate deciduous appendage at the apex, more or less included; achene oblong, or obovoid-oblong, not much compressed, with about 5 longitudinal ribs or angles and intervening rows of short pale more or less deciduous glands; pappus uniseriate, setose, very early deciduous; the setæ several, sub-equal, longer than the ovary, straight or often bent, conspicuously barbellate or setulose, whitish, the setulæ erect-patent. An annual, subglabrous, tender herb, with radical, filiform-linear, simple leaves, and saffron-yellow capitula.

1. **P. tenella** Hiern, *l.c.*, p. 290.

A fragile, slender herb, 3 to 4 in. high; leaves erect; stem abbreviated; scapes slender, bracteate, branched, striate, glabrous, crowded; bracts lanceolate, rather small, sessile, clasping, in one case ternate; capitula $\frac{1}{8}$ to $\frac{1}{4}$ in. in diameter, about 30-flowered; involucral scales about 8, lanceolate-oblong, $\frac{1}{8}$ to $\frac{1}{6}$ in. long, acuminate at the apex, marked with a few parallel longitudinal veins, very nearly but not quite glabrous, minutely glandular on the back; flowers about $\frac{1}{8}$ in. long or rather longer; corolla $\frac{1}{12}$ in. long; the tube narrow below, widened above, often abruptly so; the lobes lanceolate or oblong, thin except the thickened tips; anthers included or scarcely as long as the corolla-lobes; style-branches sometimes included in the anther-tube, sometimes exserted from it, but not exceeding the corolla-lobes; achenes $\frac{1}{20}$ in. long, becoming dark and very soon destitute of pappus, straight or curved, with a narrow subangular cartilaginous ring at the apex; fruit-receptacle $\frac{1}{24}$ in. in diameter.

Huilla.—Humpata pastures; fl. and fr. April 1860. Coll. Carp. 690.

There are two kinds of flower slightly differing, one with a less deeply divided corolla than the other, and with a longer androecium accompanied by a shorter style.

12. **DICHROCEPHALA** DC.; Benth. & Hook. f. Gen. Pl. ii. p. 260.

1. **D. latifolia** DC. Prodr. v. p. 372 (1836); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 303.

Golungo Alto.—An erect annual herb, 1 to $3\frac{1}{2}$ ft. high, patently branched towards the apex; leaves sometimes undivided and coarsely dentate, in other cases variously cut; habit somewhat like that of

Ambrosia, capitula heterogamous ; all the flowers tubular ; those in the centre yellowish-green, male, 4- or 5-cleft at the apex, antheriferous, with the ovary usually but not always abortive ; the outer flowers whitish, very numerous, female, compressed-tubular, 2- or 3-cleft at the apex ; achenes compressed, narrowly obovate, subtruncate, glabrous, surrounded with a whitish margin, their edges facing the centre of the capitulum (as with the carpels of *Ranunculus*) ; pappus in the female flowers consisting of very fine hyaline almost arachnoid hairs ; in the male flowers pappus very rarely quite absent, but usually consisting of 2 or 3 to 5, rarely 6 or 7 arachnoid whitish flaccid almost pellucid threads reaching the middle of the corolla. In moist gravelly places between Sange and Undelle (N-delle), rather sparingly ; fl. and fr. June 1856. No. **3510**.

Bumbo.—Flowers yellow-greenish. In moist shady situations in Serra da Xella, sporadic ; fl. Oct. 1859. No. **3511**.

13. **GRANGEA** Adans. ; Benth. & Hook. f. Gen. Pl. ii. p. 261.

1. **G. maderaspatana** Poir. Encycl. Suppl. ii. p. 825 (1811) ; O. & H. in Oliv. Fl. Trop. Afr. iii. p. 304 ; Ficalho, Pl. Uteis, p. 209 (1884).

Loanda.—A bitter aromatic annual herb, much branched from the base, with the habit of a *Cotula* ; branches decumbent or ascending ; flowers in the living state bright-yellow, almost golden in colour ; achene prolonged into a little cup, on the margin of which is a pappus in the form of cilia. Weaker specimens with an erect stem and few (1 to 5) flower-heads occur but they quickly wither. Very abundant throughout the district about pools left after the spring and summer rains ; Museque de Luiz Gomes, de Schut, etc. ; fl. and fr. May 1854, and from May to July 1858. Sometimes called *Macella* (Chamomile), but wrongly so. No. **3505**.

Ambaca.—A herb, apparently annual or biennial, with much-branched prostrate stems, and yellowish flowers. In damp bushy places on the left bank of the river Lucala, sporadic ; fl. and fr. Oct. 1856. No. **3506**.

Forma **ægyptiaca** DC. Prodr. v. p. 373 (1836) (sp.).

Mossamedes.—In moist sandy places in the public garden, sparingly ; fl. July 1859. No. **3507**.

14. **DETRIS** Adans. Fam. Pl. ii. p. 131 (1763).

Agatacha Cass. in Bull. Soc. Philom. p 175 (1815). *Agathæa* Cass. in Dict. Sc. Nat. i. Suppl. p. 77, t. 89 (1816). *Felicia* Cass. in Bull. Soc. Philom., 1818, Nov., p. 165 ; Benth. & Hook. f. Gen. Pl. ii. p. 274.

1. **D. ericifolia**.

Aster ericæ-folius Forsk. Fl. Ægypt.-Arab. pp. cxix, 150 (1775). *Athrixia ? ericæfolia* DC. Prodr. vi. p. 277 (1837). *Felicia abyssinica* Schultz Bip. in Herb. Schimp. Abyss. iii. n. 1763 ; O. & H. in Oliv. Fl. Trop. Afr. iii. p. 306. *F. Schimperi* Steud. & Hochst. ex Jaub. & Spach, Ill. Pl. Or. iv. p. 86, t. 354 (1852).

Huilla.—Flowers violet-coloured. In exposed parts of forests between Catumba and Ohai ; fl. Dec. 1859 and April 1860. No. **3446**. Flowers of a livid-violet colour. In the more elevated sparingly bushy pastures between Morro de Lopollo and Humpata ; fl. April 1860. No. **3447**.

These differ from the type of the species by the capitula being not always solitary at the extremities of the stems and branches, but often arranged in lax terminal bracteate panicles; in other respects they agree better with the form *F. abyssinica* rather than with *F. Schimperi*.

Var. ? **anthemidodes.**

A hispid, scabrid, annual herb; the central stem erect with numerous ascending branches spreading from the base in different directions, $\frac{1}{2}$ to 2 ft. high, with the habit of an *Anthemis*, but scarcely aromatic; branches rather slender and leafy, pallid, simple below; leaves alternate or the lowest ones opposite, sublinear, obtuse, sessile, $\frac{1}{4}$ to $\frac{3}{4}$ in. long, yellowish-green on both faces, densely hispid with grey rather short stiff hairs arising from a bulbous base entire; capitula sub-hemispherical, $\frac{3}{8}$ to $\frac{1}{2}$ in. in diameter, many-flowered, pedunculate, terminating the branches, forming altogether a sub-hemispherical leafy panicle as wide as the whole plant; involucral scales pauciseriate, sublinear, acute, hispid-pilose on the back, with whitish scarious margin, the outer ones rather shorter than the inner; florets whitish; ligule of the ray-florets linear-oblong, spreading; achenes flattened, with a thickened border, somewhat setulose, obovate; pappus arising from a cartilaginous ring smaller than the achene in width, white, setose, uniseriate; setæ setulose.

Mossamedes.—On damp sands along the banks of the river Bero, abundant; fl. and fr. June and Aug. 1859. No. **3435**.

2. **D. mossamedensis** Hiern, sp. n.

A pallid undershrub; older branches terete, glabrate, ashy-purplish; branchlets spreading; twigs fasciculate; hispid-pubescent, leafy, leaves alternate or approximated, linear, obtuse or apiculate at the apex, rather narrowed towards the rather broad sessile base, scabrid-hispid with stiff short whitish hairs, pale yellowish-green, grey-canescent, $\frac{1}{5}$ to $\frac{1}{2}$ in. long, entire, flat or concave; the hairs seated on a minute bulbous (glandular?) base; capitula broadly campanulate or sub-hemispherical, 15- to 20-flowered, radiate, heterogamous, $\frac{1}{6}$ to $\frac{1}{3}$ in. in diameter (including the ligules), numerous, solitary, terminating the shortly ($\frac{1}{5}$ to $\frac{2}{3}$ in.) peduncular branches, erect; involucral scales pauciseriate, linear or lanceolate, acute, ciliate and hispid or minutely papillose on the back, the outer ones about $\frac{1}{12}$ in. long, the inner ones $\frac{1}{8}$ in. long; ligulate florets female, uniseriate, $\frac{1}{6}$ to $\frac{3}{16}$ in. long, the ligule oblong, 2- or 3-toothed at the apex; disk-florets hermaphrodite, pluriseriate, $\frac{1}{8}$ in. long (exclusive of the exserted style-branches), the corolla tubular, shortly 5-lobed; anthers shortly produced at the apex, obtuse not sagittate at the base; style-branches rather short, lanceolate; young achenes minutely glandular-puberulous, somewhat compressed; pappus uniseriate, setose, shorter than the corolla, brittle; the setæ whitish, minutely barbellate; receptacle convex, naked.

Mossamedes.—In sparingly bushy maritime places between the town and the river Giraul; fl. July 1859. Only one individual seen. No. **3417**.

3. **D. hyssopifolia.**

Aster hyssopifolius Berg, Pl. Cap. p. 287 (1767).

Var. **straminea.**

A hard rigid brittle shrublet, 3 to 5 in. high, more or less grey or hoary; rootstock woody, wiry; stem much branched at and near the base, decumbent or ascending, woody; branches ascending or erect, subterete or obtusely angular by the shortly decurrent midribs of the leaves, scabrid with stiff whitish ascending short bristles which arise from a thickened base, leafy below; leaves alternate, often crowded, linear or somewhat oblong, obtusely pointed or rounded at the apex, broad at the sessile base, $\frac{1}{3}$ to $\frac{2}{3}$ in. long, thick, uninerved, entire, spreading or ascending, yellowish-green and scabrid-hispid with whitish bristles on both faces; the bristles arising from thickened glandular bases, short, rigid, spreading-ascending; capitula hemispherical, about $\frac{1}{2}$ in. in diameter, many-flowered, radiate, straw-coloured, solitary, terminating the erect more or less scabrid peduncular extremities of the branches; involucral scales pluriseriate, sublinear or lanceolate, mostly acute, hispid on the back, ultimately spreading or reflexed, the innermost the longest $\frac{1}{6}$ in. long, the outermost about $\frac{1}{12}$ in. long; ligule of the ray-florets exceeding the involucre, about $\frac{1}{20}$ in. broad; disk-florets hermaphrodite, multiseriate, numerous, $\frac{1}{4}$ in. long, the corolla from a very narrowly cylindrical base narrowly funnel-shaped, shortly lobed, obsoletely puberulous outside, the lobes deltoid-ovate; anthers with ovate lanceolate appendages at the apex, obtuse and not appendaged at the base; style-branches rather short, with subdeltoid appendages; achenes compressed, obovoid, puberulous, $\frac{1}{10}$ in. long, with a slightly thickened hispidulous margin; pappus uniseriate, $\frac{1}{6}$ in. long, sordid-white, setose; the setæ minutely setulose, erect, brittle, arising from a small cartilaginous ring at the apex of the ovary, deciduous; receptacle depresso-convex, punctulate, naked.

Mossamedes.—In rocky maritime places at Praia de Amelia; in late or past fl. July 1859. No. **3975**.

Perhaps a distinct species.

15. **ERIGERON** L.; Benth. & Hook. f. Gen. Pl. ii. p. 279.

1. **E. linifolius** Willd. Sp. Pl. iii. p. 1955 (1800) (*linifolium*); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 308.

Conyza ambigua DC. Fl. Fr. Suppl. p. 468 (1815); Lowe, Fl. Mad. i. p. 437 (1868).

Island of Madeira.—In neglected fields between Funchal and Camara dos Lobos; fl. and fr. August 1853. No. **3937**.

2. **E. arthrotrichus** Hiern, sp. n.

A slender erect hispid scabrid annual herb, 6 to 15 in. high; stem leafy and simple for two-thirds of its height up to the inflorescence, pallid, striate, with the hispid hairs jointed above the tumid base and whitish above the articulation; leaves alternate or the lower ones sometimes opposite, linear-tapering, obtuse at the apex, sessile and slightly dilated at the base, yellowish-

green, mostly suberect, $\frac{1}{3}$ to $1\frac{1}{2}$ in. long, scattered with hispid jointed hairs like but smaller than those of the stem, uninerved, the margins entire, more or less revolute; capitula hemispherical, about $\frac{1}{2}$ in. in diameter, many-flowered, pedicellate, arranged in a lax corymbose somewhat bracteate terminal panicle 2 to 5 in. in diameter; bracts like the leaves but smaller; pedicels ranging up to $2\frac{1}{2}$ in. long, ascending or erect, slender, scabrid; involucral scales pauciseriate, ultimately reflexed, sublinear or the inner ones subspathulate and lanceolate at the apex, with whitish scarious incise-ciliolate margins, minutely scaberulous on the back, glabrous inside, about $\frac{1}{6}$ in. long, the outer ones shorter; ray-florets female, uniseriate, ligulate, $\frac{1}{3}$ in. long; ray oblong, spreading, white or purple (both colours on the same specimen); disk florets hermaphrodite, multiseriate, tubular, $\frac{1}{6}$ in. long, narrowly funnel-shaped, shortly 5-cleft; anthers with lanceolate appendages at the apex, obtuse at the base; style-branches (inclusive of the appendage) very narrowly linear-lanceolate, flattened, papillose on the margins; achene obovate, scattered with setulæ, rather thickened on the margin and a little constricted about the apex at the ring from which arises the white uniseriate setose suberect pappus of $\frac{1}{12}$ to $\frac{1}{10}$ in. long; setæ partially setulose; receptacle naked, nearly smooth, concave in the middle, convex about the circumference.

Huilla.—In the more elevated pastures of Empalanca amongst a few scattered bushes, apparently rare; fl. and fr. April 1860. No. **3445**.

3. **E. Welwitschii** Hiern, sp. n.

An erect rather robust herb, 2 ft. high and more, apparently annual; stem rather pallid, striate, simple leafy and glabrous or sparingly pilose up to two-thirds of its height where the inflorescence begins; leaves sublinear, slightly tapering to an obtuse apex, sessile and scarcely dilated at the base, alternate or the very lowest opposite, glabrous or nearly so, yellowish-green on both faces, uninerved, 1 to 4 in. long; margins entire, very narrowly subrevolute; capitula sub-hemispherical, $\frac{2}{3}$ to $\frac{3}{4}$ in. in diameter, many-flowered, pedicellate, arranged in a rather lax corymbose bracteate terminal panicle 3 to 8 in. in diameter; bracts like the leaves but smaller; pedicels rather slender, scaberulous towards the apex; involucral scales pauciseriate, ultimately spreading, sublinear: the inner ones the longest, with narrow whitish scarious margins, acute, $\frac{1}{3}$ in. long, hispidulous-scaberulous on the back, glabrous inside, the outer ones smaller; ray-florets female, uniseriate, ligulate, $\frac{1}{3}$ in. long; ray oblong, spreading, white or very rarely purple-violaceous; disk florets hermaphrodite, multiseriate, tubular, subcylindrical, $\frac{1}{7}$ in. long, shortly 5-cleft; anthers with narrow lanceolate appendages at the apex, obtuse at the base; style-branches with narrowly lanceolate appendages; achene shortly obovate, somewhat compressed, scattered when young with short setæ, ultimately nearly glabrate; pappus white, uniseriate, with a broad base, $\frac{1}{10}$ in. long, setose; the setæ patently setulose.

Huilla.—In wooded, sparingly bushy meadows between Catumba and Hay, abundant but seen nowhere else; fl. and fr. May 1860. No. **3448**.

Allied to *E. Grantii* Oliv. & Hiern.

16. **MICROGLOSSA** DC.; Benth. & Hook. f. Gen. Pl. ii. p. 282.

1. **M. volubilis** DC. Prodr. v. p. 320 (1836); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 309.

Conyza pyrifolia Lam. Encycl. Méth. ii. p. 89 (1786). *C. volubilis* Wall. List n. 3057 (1828). *Psiadia volubilis* Baill. Hist. Pl. viii. p. 300 (1886). *M. pyrifolia* O. Kuntze, Rev. Gen. Pl. i. p. 353.

Golungo Alto.—A scandent shrublet or an erect shrub with the ultimate branches climbing; leaves alternate, beneath tomentellous pellucidly reticulate and scattered with little glands; capitula heterogamous; outer involucral scales obtuse, hispid; the inner ones longer, smooth, oblong, more or less fimbriate at the apex; the flower-heads appear yellowish on account of the colour of the involucres; florets whitish or pale-yellowish; ray-florets pluriseriate, female, ligulate, filiform, very slender; hermaphrodite florets, central, few, 1 to 3, tubular, the corolla pretty deeply 5-cleft; anthers very shortly cordate at the base, with obtuse auricles; achene obovoid, scarcely obconical-oblong, rather compressed, thinly pilose; pappus uniseriate, setose; the setæ straight, shortly hispidulous, whitish, beautifully cinnamon-brown, shining; receptacle obsoletely fimbrillate. In reed-beds by the Delamboa, in the drier places; fl. and fr. July 1856. No. **3410**. An undershrub, 3 to 3½ ft. high, sometimes almost sarmentose and subscandent; flowers pallid-yellowish or rather whitish. By thickets near Cungunho in Sobato de Bumba; fl. and fr. end of Sept. 1855. No. **3411**.

Cazengo.—A shrub, 4 ft. high and more, with quite patent branches and whitish flowers tinged with violet. In secondary thickets at the foot of Mount Muxaûlo; fl. and fr. June 1855. A sort of "Molûlu" (?). No. **3412**.

Pungo Andongo.—No notes. Fl. and fr. No. **3413**.

Bumbo.—A shrub, 3 to 5 ft. high, loosely branched; the ultimate branchlets occasionally elongated, quasi-scandent; leaves pellucidly reticulate and punctate; flowers pallid-whitish or occasionally straw-coloured. In stony wooded places at the base of the mountains of Serra da Chella, near Chão de Chella, sporadic, and between Bumbo and Mumpulla; sparingly in fl. and fr. Oct. 1859. No. **3409**.

2. **M. angolensis** O. & H., *l.c.*

Golungo Alto.—A herb, 2 ft. high, with pallid-yellowish flowers. On grassy declivities about the base of the mountains of Serra de Alto Queta, at Sange; fl. and fr. July 1856. No. **3917**. At Quibixe; fl. and fr. July 1855. No. **3919**.

Zengas do Queta.—An erect herb, 2 to 2½ ft. high, with the habit of an *Erigeron*; capitula heterogamous; ray-florets bi- or pluri-seriate, female, with patent linear ligules of a very pallid-sulphur colour; disk-florets tubular-campanulate, 5-cleft, yellow, the anther-tube exserted. On rather dry declivities among the mountains of the Central Queta; fl. and fr. 15 Sept. 1856. No. **3918**.

This plant is a robust herb with a woody rootstock; it has usually been described as an erect shrub of 3 to 5 ft.

17. **NIDORELLA** Cass.; Benth. & Hook. f. Gen. Pl. ii. p. 282.

1. **N. resedifolia** DC. Prodr. v. p. 322 (1836); Harv. & Sond. Fl. Cap. iii. p. 88 (*resedæfolia*) (1865).

Var. **humilis**. Rootstock creeping, wiry-woody, perennial; stems 6 to 13 in. high, erect or ascending, simple below from near the base.

Huilla.—Flowers yellow. In bushy pastures on the right bank of the river of Lopollo, abundant; fl. and fr. Oct. and Dec. 1859. No. **3978**. Flowers yellowish. At the outskirts of forests near Catumba; fl. Dec. 1859. No. **3979**. A form with toothed or almost laciniate-pinnate leaves collected in the same place. Catumba; fl. and fr. Jan. 1860. No. **3980**.

2. **N. solidaginea** DC., *l.c.*; Harv. & Sond., *l.c.*, p. 89.

Microglossa angolensis, var. *linearifolia* O. Hoffm. in Bol. Soc. Brot. xiii. p. 22 (1896), quoad Nos. Welw.

Huilla.—Flowers yellow. In wooded sandy meadows near Lopollo; fl. and fr. Dec. 1859. No. **3418**. In wooded thickets from Ferrão da Sola towards Jáu; fl. and fr. April 1860; seen only in that locality. No. **3419**.

18. **MARSEA** Adans. Fam. Pl. ii. p. 122 (1763).

Conyza Less. p.p. (1832); Benth. & Hook. f. Gen. Pl. ii. p. 283; non L.

In the first edition of the Species Plantarum Linnæus had eleven species of *Conyza*, none of which are now retained therein; they belong to *Vernonia*, *Sericocarpus*, *Pluchea*, *Inula*, and *Neurolæna*. In the tenth edition of the Systema Naturæ, published in 1759, Linnæus had two additional species, now referred to *Vernonia* and *Pluchea* respectively; in later publications, posterior to Adanson, *l.c.*, he had nine other species of *Conyza*, belonging to *Vernonia*, *Placus*, *Pterocaulon*, and *Phagnalon*; the whole of the Linnean species, therefore, disappear from *Conyza*. *Marsea* was established by Adanson as a genus, with *Baccharis ivæfolia* L. (*C. ivæfolia* Less.) as its type, and was differentiated from *Conyza* L. (*Conysa*).

1. **M. persicifolia.**

Erigeron persicifolium Benth. in Hook. Niger Fl. p. 430 (1849). *Conyza persicæfolia* O. & H. in Oliv. Fl. Trop. Afr. iii. p. 312.

Golungo Alto.—An undershrub, 2 to 4 ft. high; branches fistular, spreading, often irregularly bent or pendulous; flowers very pale-ochroleucous; ligulate florets absent. At the outskirts of thickets near Canguerasange, sporadic; fl. and fr. end of Oct. and 1 Dec. 1854. No. **3916**.

Ambaca.—A tree-shaped shrub, 5 to 8 ft. high; the trunk scarcely $\frac{1}{3}$ in. thick, erect or leaning, patently branched towards the apex; branches elongated, almost virgate. Ligulate florets absent; disk-florets yellow, concealed in the pappus as it develops. In thinly-bushy places near Ambaca; fl. and fr. beginning of Aug. 1856. No. **3915**.

2. **M. ægyptiaca.**

Erigeron ægyptiacum L. Mant. Pl. (i.), p. 112 (1767). *Conyza*

ægyptiaca Ait. Hort. Kew., edit. 1, iii. p. 183 (1789); O. & H., *l.c.*, p. 314.

Ambriz.—Quisembo; fr. Nov. 1853. No. **3429**.

Golungo Alto.—A herb, 2½ to 3½ ft. high, bright green in the living state; flowers yellowish. In moist places at the outskirts of palm-groves, near Trombeta and Cambondo, rather rare; fl. and fr. June 1855. No. **3431**. In sparingly grassy hilly places near N'delle; fl. and fr. April and May 1856. No. **3428**. No notes. Fr. No. **3426**. Herbaceous, 2 to 3 ft. high; branches crowded; leaves ligulate-lanceolate, dentate; capitula globose, straw-coloured. Sobato de Bango; fr. Dec. 1854. Coll. Carp. 663.

Pungo Andongo.—An annual herb; stem ascending or sub-erect, 2 to 3 ft. high, branched, patently pilose, leafy; florets pale-yellowish; habit of *Erigeron*. In wooded bushy sandy places between the præsidium and Luxillo; fl. and fr. May 1857. No. **3432**.

Huilla.—Flowers yellowish. In the wooded meadows of the Eme, amongst tall herbs; fl. and fr. Feb. 1860. No. **3430**. On sandy plains between Lopollo and Quipungo, by the roadside near the latter place, sporadic; fl.-bud, Feb. 1860. No. **3433**.

Of the above Nos. 3430 and 3431 have their leaves pinnatipartite with sublinear lobes, and have therefore been referred by O. Hoffmann in Bol. Soc. Brot. xiii., p. 23 (1896) to a variety *C. linearifloba* DC. Prodr. v., p. 385 (1836); No. 3432 has leaves occupying an intermediate position between this variety and the typical form of the species. No. 3426 has the pedicels of the capitula ranging up to 3 in. long and the achenes nearly glabrous; it thus approaches *C. senegalensis* Willd.; the pappus, however, is somewhat reddish.

3. **M. spartioides.**

Conyza spartioides O. Hoffm. in Engl. Bot. Jahrb. xx. p. 224.

I have not seen the type of Hoffmann's plant, but the description of it agrees fairly well with the following, except that the involucral bracts are said to be oval in Hoffmann's species.

An erect somewhat scabrid perennial herb, 1½ to 2 ft. high, with the habit of a rush; rootstock more or less creeping, woody; stems and branches strict, almost leafless, sulcate, angular, rather shining, scattered with short hispid hairs arising from hard thickened bases; leaves alternate, few, suberect, sublinear, pointed, rather thickened at the sessile base, entire, somewhat hispid-scabrid, $\frac{1}{6}$ to $\frac{1}{2}$ in. long; capitula heterogamous, disciform, hemispheroidal, $\frac{1}{6}$ to $\frac{1}{4}$ in. in diameter, many-flowered, on very short pubescent bracteate pedicels, a few together in small pedunculate clusters arranged in a terminal subcorymbose cyme $\frac{3}{4}$ in. in diameter; involucral scales obtuse or subacute, puberulous on the back, sublinear or linear-oblong, uninerved, pauciseriate, subequal in length, $\frac{1}{8}$ in. long or a little longer, narrowly subscarious and ciliolate on the margin; bracts on the pedicels few, resembling the involucral scales; hermaphrodite florets numerous, multiseriate, central, $\frac{1}{8}$ in. long or a little longer; corolla narrowly funnel-shaped, from a quasi-stipitate base, sessile-glandular outside, yellow, shortly 5-lobed, those of the female flowers small and slender; the lobes triangular; anthers obtuse at the base,

produced at the apex into short triangular-lanceolate pointed appendages; style glabrous or nearly so up to its 2 short lanceolate acute narrow included hispidulous-ciliate branches; ovary very short, scattered with some long pallid spreading hairs, with a broad callus at the base; female florets outer, pauciseriate, narrowly tubular, rather shorter than the hermaphrodite florets but with the ovary longer than in them; young achene somewhat compressed, rather broader upwards, $\frac{1}{24}$ in. long, hairy; basal callus perforated; pappus sub-biseriate, setose, straw-coloured, $\frac{1}{12}$ in. long; the setæ numerous, unequal, setulose; receptacle depresso-convex, shallowly pitted, beset except about the circumference with subpaleaceous setæ.

Ambaca.—On wooded hills near Puri-Cacarambola, sparingly, in company with *Pollichia physaloides*; (Welw. herb. No. 5450); fl. and young fr. Oct. 1856. No. **4005**.

The general appearance of the plant suggests the genus *Nidorella*, but the technical characters are rather of *Marsea*.

4. **M. Gouani.**

Erigeron Gouani L. Mant. Pl. alt. p. 469 (1771). *Conyza Gouani* Willd. Sp. Pl. iii. p. 1928 (1800); O. & H., *l.c.*, p. 316.

Ambaca.—A herb, apparently biennial, with the habit of an *Erigeron*; stem ascending, branched in the upper part; florets yellowish. In the gravelly beds of dried-up rivulets between Canaûlo and Cabinda, and from the latter towards Izanga; fl. and fr. Oct. 1856. No. **3439**.

Pungo Andongo.—Stoloniferous. In wet wooded meadows between Luxillo and Cazella; fl. and young fr. April 1857. This is probably the plant referred to by Welwitsch in Journ. Linn. Soc. iii., p. 154 (1859), as a kind of *Erigeron*. No. **3425**. A herb with erect stems from a perennial rootstock, 1 to 3 ft. high and yellowish flowers. In the rocky thickets of Valle de Cabondo, rather rare; fl. Feb. 1857. No. **3438**.

Huilla.—At Lopollo; fl. and fr. Dec. 1859. No. **3423**. Flowers yellowish. In rich pastures near Lopollo; fl. Jan. 1860. No. **3424**. In places of cultivation near Lopollo; fl. and fr. Feb. 1860. Root præmorse, fibrous; stem 3 ft. high, sparingly branched. One specimen, copied for the British Museum set. No. **3437**.

5. **M. pyrrhopappa.**

Conyza pyrrhopappa Schultz Bip. ex A. Rich. Fl. Abyss. i. p. 389 (1847); O. & H., *l.c.*, p. 318. *Erigeron pyrrhopappus* Schultz Bip. in Schweinf. Fl. Æthiop. (i.), p. 147 (1867).

Huilla.—An undershrub, 2 to 3 ft. high. In neglected fields in the Lopollo country; fl. and fr. Nov. 1859 and end of Jan. 1860. No. **3427**.

This plant by number is quoted by O. Hoffmann in Bol. Soc. Brot. xiii., p. 23 (1896), as belonging to *M. Gouani*.

6. **M. stricta.**

Conyza stricta Willd., *l.c.*, p. 1922 (1800); O. & H., *l.c.*

Ambaca.—An annual or more frequently a biennial herb, erect, with the habit nearly of *Erigeron*, simple stem, and sordid-yellowish flowers. In sandy and gravelly places along the banks of the streams

between Quibinda and Izanga, not common; fl. and fr. Oct. 1856. No. **3421**.

Huilla.—Flowers yellowish. On exposed hills at the borders of fields and among crops; fl. and fr. Jan. 1860. No. **3422**. In fields after a crop of *Andropogon Sorghum* Brot., near Lopollo; fl. and fr. Feb. and May 1860. A pubescent strictly erect simple herb, 1½ ft. high. One specimen. No. **3436**.

19. **PSIADIA** Jacq.; Benth. & Hook. f. Gen. Pl. ii. p. 284.

1. **P. arabica** Jaub. & Spach, Illustr. Pl. Orient. iv. p. 85, tt. 352, 353 (1850–53); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 319.

Huilla.—A slender shrublet, 3 to 4 ft. high, with red stem and yellow flowers. In thickets at the outskirts of the forest, near lake Ivantâla; fl. and fr. end of Feb. 1860. No. **3912**. A glutinous little shrub, 21 in. high or more, branched at the root, remarkable by reason of its foliage and inflorescence exuding a gummy resin. In shrubberies between Mumpulla and Nene; fl.-bud Oct. 1859. No. **3913**. Flowers yellowish. In thickets composed of *Duranta erecta* L. (Welw. Herb. no. 5760), and *Clerodendron* (Welw. Herb. no. 5763), near Lopollo, sporadic; fl. and fr. Dec. 1859. No. **3914**.

Our specimens differ from the form of the plant usual in other parts of tropical Africa by their finely serrulate willow-like leaves, and the serratures are nearer together and more constantly present than in the type of the species.

2. **P. lycioides** Hiern, sp. n.

A nearly glabrous shrublet, 3 to 4 ft. high, with the habit nearly of *Lycium*; stems numerous, cæspitose, virgate-oblique; branches rather slender, pallid-purplish, subterete, sulcate striate, leafy; branchlets often inclined in one direction and very leafy; leaves alternate, narrowly oblanceolate-linear, obtuse or somewhat pointed at the apex, attenuate towards the sessile or subsessile base, rather fleshy, viscid, dull yellowish-green on both faces, ½ to 2 in. long by $\frac{1}{20}$ to ⅕ in. broad, entire; capitula disciform, campanulate-oblong, ⅕ in. long, ⅛ in. in diameter, many-flowered, subsessile in small clusters or some on short peduncles, arranged in small sub-thyrsoid cymes terminating the lateral shoots or branches; involucral bracts pluriseriate, unequal, lanceolate or sublinear, obtuse, imbricate, yellowish or straw-coloured with greenish midrib, glandular-puberulous, ciliate, the inner ones ranging up to ⅕ in. long, the outer ones gradually shorter; corollas yellow, not exserted, those of the central hermaphrodite florets narrowly tubular, shortly 5-lobed, those of the numerous outer female florets very slender, rather shorter than or scarcely equalling the former; the lobes oval-oblong, obtuse, minutely sessile-glandular outside; anthers obtuse, entire, not sagittate at the base; style glabrous, shortly bilobed, the branched with narrow acute tips; ovary somewhat compressed, glabrous, or minutely sessile-glandular, small; pappus setose, straw-coloured, uniseriate, about as long as the corollas of the hermaphrodite flowers, easily detached; the setæ straight, erect, barbellate; receptacle convex, irregularly pitted and shortly fimbrillate, not paleaceous; ripe achenes not seen.

Mossamedes.—In sandy submaritime places to the north of the town, very plentiful but seen only in one spot; very few specimens in fl. beginning of July 1859. No. **3977**.

None of the florets appear to be ligulate.

3. **P. incana** O. & H. in Oliv. Fl. Trop. Afr. iii. p. 320.

Huilla.—A slender shrublet, with the habit of a *Solidago*, 5 ft. high or a little taller; branches sparse, rambling; capitula heterogamous, radiate; flowers yellow; the ray-florets ligulate, the ligules obtuse and entire at the apex; disk-florets hermaphrodite 5-lobed; style-branches exserted, shortly and densely pilose, obtuse; achenes pilose; pappus uniseriate, setose, the setæ remotely setulose. On rocky sparingly bushy hills about Catumba, sporadic; fl. and fr. April 1860. No. **3920**. A branched shrub 3 to 4 ft. high, with yellow flowers. In rocky thickets at Catumba. Perhaps one of the plants called "Quitoco"; fl. and fr. April 1860. No. **3921**.

Our specimens differ from the type of the species by a less densely branched and somewhat rambling habit; they may be considered as constituting a variety (var. **vagans**).

Tribe IV.—Inuloideæ.

The following number, with oval, apiculate, thinly coriaceous, acutely toothed, alternate, petiolate leaves 2 to $3\frac{1}{2}$ in. long by 1 to 2 in. broad glabrescent yellowish-green and minutely reticulate above whitish-felted beneath, has the habit of the genus *Brachylæna*; but the specimens do not suffice for absolute reference.

Huilla.—A shrub of 5 to 6 ft., apparently the fresh shoots of a tree damaged by the burning of the woods. In mountainous rocky rather elevated places in Morro de Lopollo, rather rare; without either fl. or fr. end of March 1860. No. **3523**.

20. **TARCHONANTHUS** L.; Benth. & Hook. f. Gen. Pl. ii. p. 288.

1. **T. camphoratus** L. Sp. Pl. edit. 1, p. 842 (1753); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 321; Ficalho, Pl. Uteis, p. 206 (1884); Engl. Hochgebirgsfl. p. 421 (1892).

Huilla.—A tree, exactly with the habit of a European broad-leaved olive, attaining in the primitive forests a height of 15 to 25 ft. or more, with its solid white-grey trunk full of cracks outside and reaching 15 in. in diameter, and with its spreading branches and branchlets forming a broad head; but in the secondary woods or those formerly burnt, only a tree of 8 to 15 ft. with rather erect branches and branchlets; leaves variable in shape, much larger in the young plant than in the adult, elongate-obovate or elliptic-obovate, the top ones lanceolate and bright green above, white-tomentose beneath with the very short felt soft to the touch, evergreen; capitula homogamous, many-flowered, arranged in axillary racemes, apparently dicœcious by abortion; corolla white, naked inside, very densely white-shaggy outside, tubular; the tube obconical; the limb 5-cleft, with erect-spreading lobes; anthers exserted, loosely cohering or nearly free, bi-setose at the base; style far exserted, scarcely or not at all bidentate but obtusely glandular at the apex; ovary 0 in the male plant; receptacle shaggy, narrow. In dense mixed forests to the south of the Lopollo colony, at Catumba, plentiful; male fl. 11 April 1860. Timber

aromatic, excellent. No. **3524**. A small tree, 8 to 15 ft. high, or even more, forming, together with another kind of tree, little forests in Sobato de Mumpulla, abundant ; fl.-bud and male and female fl. Oct. 1859. A species of *Viscum* grew on this tree. Nos. **3522** and **6745**. In the male flowers the involucre 4-lobed, with broadly ovate lobes ; corolla white, 5- or very rarely 4-lobed, shaggy outside, smooth inside ; stamens 5, exserted ; style far exserted, rather fleshy ; stigma scarcely divided ; ovary abortive ; nectary apparently none. Local name "Páo Quicongo." Nos. **3523, 3525-7**.

Quicongo is a name used in a collective sense in the markets at Benguella, Loanda, and Ambriz, for various aromatic woods. The Quicango of Huilla is a tree which, in company with that called Nocha or Noxa (*Parinari Mobola*) and some species of Leguminosæ and Proteaceæ, constitute the principal part of the forest in the delightful plateau of Huilla ; it occurs most abundantly from the top of the Serra de Xella to the neighbourhood of the great lake of Ivantâla, forming in some places by itself extensive forests which recall the olive woods in Portugal ; the greatest height here attained by this tree is 20 to 25 ft. with its trunk rarely exceeding a foot thick ; but there is reason to expect that, as with the other constituents of the forest, it would under other circumstances become more developed and assume larger dimensions. The principal causes of the successive checks on the arboreal vegetation of these regions are not only the destructive forest fires which the natives annually make for the purpose of obtaining succulent pasturage for their numerous flocks of sheep, but also the repeated invasions of the Munanos, whose vast encampments are always constructed at the cost of the extensive forests.

The timber is of an olive colour, becoming sometimes dark brown or dark purple, of fine grain, very compact and durable, and thus very suitable for turnery, furniture, and other domestic articles, with the special recommendation of a camphor-like aroma, which enables the natives to prepare tonic and stomachic infusions from its powder, so that it is met with under different names in nearly all the *quitandas* (markets) on the coast, and fragments of it are suspended from the necks of nearly all negro travellers in Angola. (Welw. Synopse, p. 16, n. 41).

21. **PLACUS** Lour. Fl. Cochinch. p. 496 (1790).

Blumea DC. in Guill. Arch. Bot. ii. p. 514 (1833) ; Benth. & Hook. f. Gen. Pl. ii. p. 289.

1. **P. lacerus** O. Kuntze, Rev. Gen. Pl. i. p. 356 (1891).

Conyza lacera Burm. f. Fl. Ind. p. 180, t. 59, fig. 1 (1768). *Blumea lacera* DC. in Wight, Contrib. Bot. Ind. p. 14 (1834) ; O. & H. in Oliv. Fl. Trop. Afr. iii. p. 322.

Ambriz.—Root conical, apparently annual ; stem with crowded leaves at the base ; fr. No. **3911**.

Barra do Bengo.—An annual erect herb, with yellowish flowers. In palm-groves between Quifandongo and Barro do Bengo ; fl. Dec. 1853. Antiscorbutic. No. **3896**.

Golungo Alto.—Herbaceous, 2 to 4 ft. high, the whole plant very pleasantly fragrant with a peculiar aroma. In marshy meadows near the base of Alto Queta, and in damp places along the left bank of the river Coango ; fl. and fr. Feb. 1855. Called "Quitoco anti-scorbutico." No. **3897**. Between Trombeta and Cabondo ; fl. and fr. Sept. 1854. No. **3898**.

2. **P. natalensis** O. Kuntze, Rev. Gen. Pl. i. p. 357 (1891). Fl. Cap. *Conyza cafra* DC. Prodr. v. p. 381 (1836); Harv. & Sond. iii. p. 112 (1865) (*caffra*). *C. natalensis* Schultz Bip. ex Walp. Rep. ii. p. 971 (1843). *Blumea natalensis* Schultz Bip., *l.c.*

Mossamedes.—An erect annual herb, branched from the base, 6 to 8 in. high, with the habit of an *Erigeron*; florets violet-purple. In sandy thickets at the Garganta or mouth of the Bero, many specimens but sporadic; fl. and fr. July 1859. No. **3414**.

3. **P. gariepinus** O. Kuntze, Rev. Gen. Pl. i. p. 357 (1891). *Blumea gariepina* DC. p. 448; Harv. & Sond. *l.c.*, p. 120.

Mossamedes.—A suffrutescent herb, 3 ft. high or more; stem erect, branched from the middle; branches erect-spreading, winged with the decurrent leaves; florets yellow, turning pale in drying. In gravelly bushy places at the river Bero, near Quipola, not abundant; fl. and fr. July 1859. No. **3910**.

22. **LAGGERA** Schultz Bip.; Benth. & Hook. f. Gen. Pl. ii. p. 290.

1. **L. aurita** Schultz Bip. ex A. Rich. Fl. Abyss. i. p. 393 (1847). *Conyza aurita* L. f. Suppl. Pl. p. 367 (1781). *Blumea aurita* DC. in Wight, Contrib. Bot. Ind. p. 16 (1834); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 322.

Loanda.—A strong-scented, viscid, erect, branched, apparently annual herb, with a Senecioid habit, and purplish florets. The scent is somewhat like that of the aromatic *Chenopodia*. In flooded places in the course of drying up, about the represa (pond) of Imbondeiro dos Lobos, sparingly; in fl.-bud 8 June 1858, and fl. July 1858. No. **3894**.

Ambaca.—An annual erect herb, branched from the base, with ascending viscid-hairy branches, and yellowish flowers. In moist bushy places on the left bank of the Caringa rivulet; fl. and fr. June 1855. No. **3895**.

Huilla.—Flowers purplish. In moist meadows (varzeas) between Catumba and Ohay; fl. end of March 1860. Perhaps the variety *ægyptiaca* of *B. aurita* DC. Prodr. v. p. 449 (1836). No. **3909**.

No locality nor notes; fr. annual. A poor specimen, probably this species. No. **3933**.

2. **L. purpurascens** Schultz Bip., *l.c.*, p. 395.

Blume pterodonta DC. in Wight, Contrib. Bot. Ind. p. 16 (1834). *B. purpurascens* A. Rich., *l.c.*, i. p. 395; *Serratula polygona* A. Rich., *l.c.*, i. p. 457, t. 62. *L. pterodonta* Schultz Bip. in Schweinf. Beitr. Fl. Æthiop. p. 151 (1865); O. & H., *l.c.*, p. 324.

Huilla.—On wooded hills along the road towards Catumba in the Lopollo country; without fl. beginning of April 1860. The species was so determined by Welwitsch. No. **3899**.

3. **L. alata** Schultz Bip. ex Oliv. in Trans. Linn. Soc. xxix. p. 94, 187 (1873); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 326.

Conyza alata Roxb. Hort. Beng. p. 61 (1814). *Blumea alata* DC., *l.c.*, p. 448.

Golungo Alto.—Flowers purplish. In moist parts of Varzea do Isidro, among tall grasses; fl. and fr. July 1856, A form with much

smaller capitula and narrower leaves than in the common one. No. **3900**. A strict herb, 2½ to 4 ft. high ; leaves in the living state glaucescent-green, rather rigid and spreading, rough ; flowers reddish. In the less dense wooded elevated parts of the Queta mountains, rather rare ; fl. and fr. middle of May 1856. No. **3901**. An erect annual herb, 1 to 3½ ft. high, with nodding capitula and rosy flowers. In moist places at the outskirts of forests about Sange and Bango, abundant ; fl. and fr. July 1855. No. **3902**.

4. **L. brevipes** O. & H. in Oliv. Fl. Trop. Afr. iii. p. 327.

Ambaca.—A robust, dichotomously branched herb, 4 to 4½ ft. high, with reddish flowers. In bushy places on the left bank of the Caringa stream ; fl. and fr. June 1855. No. **3905**.

Golungo Alto.—A tall biennial or triennial herb, 4 to 5 ft. high, branched from the base, the whole plant pleasantly aromatic almost like *Melissa officinalis* L. In moist places along the banks of the river Coango by the lower thickets, not abundant ; fl. not fully developed at the beginning of June 1856 ; fl. Aug. No. **3904**.

Huilla.—A bright-green annual or biennial herb, 3 to 4 ft. high or exceptionally 6 ft. ; flowers purplish. In hilly places among rather tall bushes along the Catumba forests ; fl. April 1860. Used as a medicinal plant by the negroes. No. **3903**.

23. **PLUCHEA** Cass. in Bull. Soc. Philom., (Feb.) 1817, p. 31 ; Benth. & Hook. f. Gen. Pl. ii. p. 290. *Gynema* Rafin. Fl. Ludov. p. 63 (1817).

1. **P. ovalis** DC. Prodr. v. p. 450 (1836) ; O. & H. in Oliv. Fl. Trop. Afr. iii. p. 328 ; O. Hoffm. in Bol. Soc. Brot. xiii. p. 23.

Bumbo.—A melancholy shrub, 3 to 4 ft. high ; branches erect-spreading, downy, winged with the decurrent leaves ; flowers yellow. In sunny rocky places scattered with trees, above Bumbo, in the ascent of the mountains of Serra da Chella, at an elevation of 2500 to 3000 ft. ; fl. and young fr. Oct. 1859. No. **3434**.

2. **P. Dioscoridis** DC., *l.c.* ; O. & H., *l.c.*, p. 329.

Baccharis dioscoridis L. Cent. Pl. i. p. 27, n. 80 (1755), cf. *Conyza odora ?* Forsk. Fl. Ægypt. pp. lxxiii, 148 (1775).

Ambriz.—A suffrutescent herb or even shrubby, with several stems, attaining 5 ft. in height, shortly branched towards the apex, remarkably and very agreeably aromatic ; capitula heterogamous, many-flowered ; the florets of the outer rows female, filiform, with truncate or more frequently tridentate ligules ; the central florets few, hermaphrodite ; anthers with acute rather long tails at the base ; achenes cylindrical, sulcate ; pappus uniseriate, rather livid, not scabrous. Heights of Ambriz ; fl. and fr. Nov. 1853. The true "Quitoco" of the negroes. No. **3927**.

Icolo e Bengo.—A shrub of 4 to 6 ft., rarely higher, branched from the base ; branches and branchlets patent ; leaves rather limp, aromatic ; flowers violet-rosy ; styles of the central florets thick, rather bristly, their branches often cohering. In bushy places flooded in summer by the river Bengo, from Prata as far as Tandambondo, abundant ; fl. and fr. Sept. 1857. It appears that the Quitoco occurring in the coast region is a different plant. No. **3926**.

Loanda.—Calumbo ; fl. and fr. April 1858. Called "Quitoco pequeno," that is, small Quitoco ; believed to be the plant used there

by women, in the form of a decoction, for procuring abortion. The branchlets were given to Welwitsch by Freiro. No. **3924**.

Pungo Andongo.—A shrub as tall as a man or an undershrub; flowers lilac. In damp places near Salinas de Dungo in Sobato Canhaco, amid tall grasses; fl. and fr. March 1857. "Quitoco." No. **3925**.

Mossamedes.—An aromatic shrub or usually only an undershrub; flowers purple. In thickets along the banks of the river Bengo, rather rare; fl. and fr. July and August 1859. No. **3922**. A shrub, 5 ft. high, with purplish flowers. In moist thickets at the river Maiombo; fl. and fr. June 1860. A kind of Quitoco. No. **3923**.

The name Quitoco is used in Brazil for another species of the genus, namely, *P. Quitoc* DC.; in Angola it is used also for *Placus lacerus* O. Kuntze. See Ficalho, Pl. Uteis, p. 208 (1884).

24. **EPALTES** Cass.; Benth. & Hook. f. Gen. Pl. iii. p. 293.

1. **E. brasiliensis** DC. Prodr. v. p. 461 (1836); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 331.

Ethulia brasiliensis Link, Enum. Herb. Berol. ii. p. 310 (1822). *Erigerodes brasiliense* O. Kuntze, Rev. Gen. Pl. i. p. 335 (1891).

Prince's Island.—Mountainous region; fl. Sept. 1853. No. **3520**.

2. **E. garipina** Steetz in Peters, Mossamb. Bot. (ii.), p. 451 (1863); O. & H., *l.c.*, p. 332 (*gariepina*); Ficalho, Pl. Uteis, p. 209 (1884).

Ethulia? gariepina DC., *l.c.*, p. 13. *Erigerodes gariepinum* O. Kuntze, *l.c.*

Mossamedes.—An undershrub, becoming in old age very woody and almost a little shrub, 1 to 2½ ft. high; stem with numerous straight branches decurrent-winged, both as well as the foliage scattered with small branny scales; flowers of a bright violet colour; aroma of the whole plant very agreeable as in some species of *Placus*. In sandy and rocky places flooded in summer, in company with Ebenaceæ (*Euclea pseudebenus* E. Mey.; Herb. No. 2544), behind the town along the banks of the river Bero, in Prata de Carpenteiro, not uncommon; fl. July 1859. "Carqueja Bernardini." No. **3521**. A perennial herb; stems numerous, nearly erect, 2 ft. high, corymbosely branched; flowers rosy-violet. At Boca do Rio Bero; fl. and fr. June 1860. Coll. Carp. 97.

25. **SPHÆRANTHUS** L.; Benth. & Hook. f. Gen. Pl. ii. p. 294.

1. **S. hirtus** Willd. Sp. Pl. iii. p. 2395 (1800); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 334; non Gaertn.

S. senegalensis DC. Prodr. v. p. 370 (1836).

Barra do Bengo and Loanda.—An annual prostrate herb, with ascending branchlets and rosy flowers; in clayey and sandy places flooded in summer near Imbondeiro dos Lobos, not uncommon; fl. and fr. June and July 1853. An annual fragrant herb, sometimes scarcely 2 in. high, in other cases nearly 2 ft., growing in dense masses; leaves scarcely properly termed lanceolate but rather ovate-spathulate, agreeing in other respects with the description of *S. senegalensis* DC.; capitula violet-rosy, elegant; in wooded places (with *Adansonia digitata* B. Juss.) flooded in the rainy season between Teba and Quicuxe; fl. and fr. Dec. 1853 and May 1854. In muddy places

flooded in summer near Imbondeiro dos Lobos and between Quicuxe and Cacuaco, plentiful; fl. and fr. June 1858. No. **3503.**

2. **S. angolensis** O. Hoffm. in Engl. Bot. Jahrb. xx. p. 228 (16 Nov. 1894).

Libongo.—On the dried-up mud of the lakes along the river Lifune near Libongo, abundant; fl. mostly fallen, Aug. 1858. No. **3509.**

26. **PHAGNALON** Cass.; Benth. & Hook. f. Gen Pl. i. p. 304.

1. **P. saxatile** Cass. in Bull. Soc. Philom., 1819 (Nov.), p. 174. *Gnaphalium saxatile* L. Sp. Pl., edit. 1, p. 857 (1753). *Conyza saxatilis* L. Sp. Pl., edit. 2, p. 1206 (1763). *Gnaphalon saxatile* Lowe, Man. Fl. Mad. i. p. 438 (1868).

Island of Madeira.—In stony places between Funchal and Camara dos Lobos; fr. Aug. 1853. Only one specimen. No. **3944.**

27. **ACHYROCLINE** DC. Prodr. vi. p. 219 (1837); Benth. & Hook. f. Gen. Pl. ii. p. 305.

Gnaphalium, Sect. *Achyrocline* Less. Syn. Compos. p. 332 (1832).

1. **A. Hochstetteri** Schultz Bip. ex A. Rich. Fl. Abyss. i. p. 429 (1847); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 339.

Huilla.—At the banks of nearly dried up streams by the road towards Jáu, amongst tall herbage; not yet in fully open fl. end of March 1860. No. **3471.**

28. **GNAPHALIUM** L.; Benth. & Hook. f. Gen. Pl. ii. p. 305.

1. **G. luteo-album** L. Sp. Pl., edit. 1, p. 851 (1753); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 343.

Barra do Dande.—An annual herb, mostly branched from the base, 1 to 1½ ft. high; involucral scales pellucid-stramineous; flowers yellowish. In swampy places about lakes on the right bank of the river Dande, near Bomba, here and there; fl. and fr. end of Sept. 1858. No. **3465.**

Zenza do Golungo.—In damp bushy places between Calumguembo and the Mongolo mountains; fl. and fr. Sept. 1854. No. **3464.**

Golungo Alto.—An erect silky-hoary little herb, with yellow flowers. In thinly bushy places at the river Quiapoze; fl. and fr. July 1856. No. **3470.**

Pungo Andongo.—No notes. Fl. and fr. No. **3466.**

Mossamedes.—An annual herb, branched from the base, with ascending stems, 1 to 1½ ft. high. In sandy places at the banks of the rivers Bero and Giraul, abundant; fl.-bud July 1859. No. **3469.**

Huilla.—In hilly places near Humpata, amongst low bushes; fl. and fr. April 1860. No. **3467.** Flowers yellow-whitish. In exposed sandy places about Lopollo, not common; fl. and fr., May 1860. No. **3468.** Flowers whitish. In exposed sandy places by streams near Lopollo; fl. and fr. May 1860. This has white scarious tips to the involucral scales and limp foliage; it differs somewhat from the type of the species and was considered distinct by Welwitsch. No. **3453.** In the pastures of Mumpulla; fl. and fr. Oct. 1859. No. **3488.**

2. **G. indicum** L. Sp. Pl., edit. 1, p. 852 (1753).

G. niliacum Spreng. Syst. Veg. iii. 480 (1826); O. & H., *l.c.*, p. 344.

Loanda.—Involucral scales ovate-lanceolate, straw-yellowish or very pallid, hyaline, the midrib from the base to the middle always green and broad. By muddy drying-up pools between Loanda and Camama near the Calumba road; fl. and fr. June 1858. No. **3462.**

Barra do Dande.—Leaves, even the cauline ones, distinctly petiolate; capitula whitish-yellowish, with straw-yellowish rather shining involucral scales. In drying-up marshes about lakes near Bombo at the river Dande, not common; fl. and fr. Sept. 1858. No. **3463.**

Golungo Alto.—At the outskirts of thickets and in gravelly places by the Chixi rivulet, not common; fl. and fr. Sept. 1854. No. **3459.**

Mossamedes.—In sandy-muddy damp places at the banks of the river Bero, abundant; fl. and fr. July 1859. No. **3460.**

Huilla.—In pastures flooded in the rainy season between Mumpulla and Nene; fl. and fr. Oct. 1859. No. **3461.**

29. **ELICHRYSUM** Adans. Fam. Pl. ii. p. 122 (1763); Gaertn. Fruct. ii. p. 404 (1791).

Trichandrum Neck. Elem. Bot. i. p. 84 (1790). *Helichrysum* Pers. Syn. Pl. ii. p. 414 (1807); Benth. & Hook. f. Gen. Pl. ii. p. 309.

1. **E. pachyrhizum** Harv. in Harv. & Sond. Fl. Cap. iii. p. 222 (1865), (*Helichrysum*); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 346.

Huilla.—In rocky hilly places between Mumpulla and Nene; fl. and fr. Oct. 1859. No. **3484.**

Our specimens are of a low stunted habit, 3 to 4 in. high, more like the South African form from the Aapjes river in the Transvaal cited by Harvey than that from South Central Tropical Africa mentioned in Oliver's Flora; the latter approaches nearer to the following forms, which are here considered as varieties:—

Var. **huillense.**

A perennial herb, silvery-tomentose throughout; rootstock thick, many-headed; stems numerous, crowded in a cæspitose manner, 8 to 12 in. long, mostly straight and unbranched for about half their length except the base, leafy, often glabrate in lower part; branches mostly straight or nearly so, densely leafy; leaves sublinear, obtuse, sessile, alternate, crowded, entire, more or less spreading or recurving, $\frac{1}{4}$ to $\frac{1}{2}$ in. long, not decurrent, rather thick; capitula purple, campanulate-oblong, sessile or subsessile, $\frac{1}{6}$ to $\frac{1}{5}$ in. long, several together crowded in sub-hemispherical head $\frac{1}{4}$ to $\frac{1}{2}$ in. in diameter, about 20-flowered, homogamous, with some loose wool at the base; involucral scales pluriseriate, mostly hyaline except the midrib near the base, usually purple about the middle; the inner ones oval or obovate, obtuse, glabrous, exceeding the corollas; the outer ones oblong, obtuse or subacute, shorter than the inner, often somewhat woolly at the back; florets all hermaphrodite; corolla $\frac{1}{12}$ in. long, yellow, glabrous except the minutely glandular lobes; ovary glabrous or nearly so; pappus rather longer than the corolla, setose, white, the setæ uniseriate, very nearly smooth; receptacle naked.

Huilla.—In very elevated pastures in Morro de Lopollo; fl. end of April 1860. No. **3501.**

Var. **mossamedense.**

A low wiry herb, annual or perhaps persisting for several years; rootstock long, descending in a more or less twisted manner, hard or somewhat woody, giving off at its crown several prostrate or decumbent stems; stems nearly simple below or more or less branched, floccose-lanate or glabrescent below, rather slender; leaves alternate, sublinear or oblanceolate, obtuse or somewhat pointed and often nigro-apiculate at the apex, not very narrow at the sessile non-decurrent base, more or less hoary-woolly on both faces or sub-obsoletely so, nearly flat or with revolute margins, rigid, $\frac{1}{6}$ to 1 in. long, entire or slightly wavy on the margins; capitula rosy-red when young, yellowish at the time of flowering, campanulate-oblong, $\frac{1}{7}$ to $\frac{1}{6}$ in. long, subsessile or sessile, usually with some loose wool at the base, about 20-flowered, homogamous, crowded many or several together in sessile terminal hemispherical or subglobose clusters $\frac{1}{4}$ to $\frac{3}{4}$ in. in diameter; involucral scales pluriseriate, imbricate, obovate or oblanceolate, thinly hyaline and white (in the dry state) except the unguiculate basal part, glabrous, rounded and occasionally cleft at the white apex, suberect or those of the outer capitula often with squarrose or revolute tips, usually somewhat rosy about the middle, the innermost ones about equalling the corollas, the outer ones successively rather shorter; florets all hermaphrodite; corolla narrowly tubular, glabrous, yellow; ovary scattered with minute glands, otherwise glabrous; pappus pale-straw-coloured or whitish (in the dry state), setose, equalling the corolla, brittle, the setæ slender, nearly smooth, deciduous; achenes scattered with small glands; receptacle small, naked or scattered with minute scales, somewhat alveolate.

Mossamedes.—In sandy places at the banks of the river Bero, very plentiful; fl. and fr. July 1859. No. **3499.** In sandy bushy places at the banks of the river Maiombo, sparingly; fl. and fr. Oct. 1859. No. **3500.** In dry sandy places at the banks of the river Bero, rather rare; fl. July 1859. A subglabrate elongated form. No. **3494.**

2. **E. helodes** Hiern, sp. n.

An erect herb, with the habit of a *Filago*, 6 to 12 in. high, more or less covered with a creamy-white felt; root wiry, sinuous, with slender fibres; stem slender, simple below, branched in the upper part; branches erect or ascending, leafy, slender; leaves alternate, sometimes fasciculate, sublinear, obtusely pointed with a minute glabrous dark-brown apiculus at the apex, sessile at the rather broad not or scarcely decurrent base, $\frac{1}{4}$ to $\frac{3}{4}$ in. long, the margin entire and more or less thickened beneath; capitula broadly campanulate or sub-hemispherical, about $\frac{1}{12}$ to $\frac{1}{10}$ in. long, woolly at the base, glabrous above, heterogamous, discoid, on very short woolly pedicels clustered in very dense branched erect subglobose cymes $\frac{1}{3}$ to $\frac{1}{2}$ in. in diameter terminating short lateral leafy branches or on short axillary peduncles; flowers yellowish; hermaphrodite florets tubular, 15 to 18, some of them

subtended by scales as long as themselves; female florets few, circumferential, filiform; involucral scales pluriseriate oblong or obovate, glabrous, about $\frac{1}{12}$ in. long, hyaline and whitish except along the midrib near the base; ovary minutely glandular or glabrous, small; pappus setose, deciduous; the setæ not numerous, rather shorter than the corolla, minutely setulose; receptacle without conspicuous fimbrillæ.

Huilla.—In very elevated marshy bushy places in Morro de Lopollo; fl. Dec. 1859. No. **3502**. In elevated spongy thickets in Morro de Lopollo, in company with species of *Drosera* and *Lycopodium*; fl. April 1860. No. **3503**.

This is nearly related to *E. declinatum* (Less.).

3. **E. auronitens** Schultz Bip. in Flora 1844, p. 680 (*Helichrysum*); Harv. & Sond., *l.c.*, p. 247 (*H. aureonitens*).

Huilla.—In the very elevated peaty pastures of the Morro (Serra) de Lopollo; fl. and fr. April 1860. No. **3489**.

4. **E. argyrosphærum** DC. Prodr. vi. p. 174 (1837) (*Helichrysum*); Harv. in Harv. & Sond. Fl. Cap. iii. p. 222 (1865).

Huilla.—In fields near Humpata; fl.-bud April 1860. No. **3487**. Flowers violet-purple. In places previously cultivated with plantations of *Sorghum*, near Banza de Soba Lopollo; fl. and fr. May 1860. A subglabrous form, with the capitula clustered a few together especially at the extremities of the branches. No. **3486**.

5. **E. roseo-niveum** Marl. & O. Hoffm. in Engl. Bot. Jahrb. x. p. 275 (1888) (*Helichrysum*); O. Hoffm. in Bol. Soc. Brot. xiii. p. 24 (1896).

Mossamedes.—A prostrate-ascending very elegant herb, annual or possibly perennial, the whole plant densely clothed with a snowy-white wool; stem branched from the base; branches spreading in all directions, very brittle; branchlets numerous; capitula campanulate, homogamous, discoid; involucral scales pluriseriate, the outer ones narrow, somewhat woolly, the inner ones glabrous oblong and obtuse or abruptly pointed; flowers bloodred-purple or somewhat greenish; receptacle nearly naked, not fimbrillate. In sandy places at Cazimba, between Cabo Negro and Praia d' Amelia, a solitary specimen (6 in. high and 15½ in. in diameter), in company with *Tumboa Bainesii* Hook. f.; fl. Sept. 1859. Nearly related to *E. H. gariepinum* (DC). No. **3485**.

6. **E. auriculatum** Less. Syn. Gen. Comp. p. 311 (1832); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 347; O. Hoffm. in Bol. Soc. Brot. xiii. p. 24 (1896) (*Helichrysum*).

Gnaphalium patulum Berg, Pl. Cap. p. 249 (1767); nec L. nec Thunb. *G. auriculatum* Thunb. Prodr. Pl. Cap. (ii.) p. 151 (1800).

Golungo Alto.—An undershrub, encumbering the lower thickets with its sarmentose branches 3 to 6 ft. long, perennial; the radical leaves the largest, ovate-oblong, thick, whitish-tomentose, fallen or dead at the time of the flowering. In the densest thickets at the base of the mountains of Queta; also in declivities behind Sange on the same side, not common; fl. and fr. July 1855. No. **3483**.

7. **E. Kilimanjari** Oliv. in Trans. Linn. Soc., ser. 2, ii. p. 338 (Oct. 1887) (*Helichrysum*).

Huilla.—A perennial herb ; primary stem erect, with the basal branches ascending, 1 to 1½ ft. high ; capitula more or less corymbose ; involucral scales sulphur-coloured, very much shining ; florets of a deep orange colour. On bushy hills near Lopollo, rather rare ; fl. beginning of March 1860. No. **3490**.

8. **E. fulgidum** Willd. Sp. Pl. iii. p. 1904 (1800); Harv. in Harv. & Sond. Fl. Cap. iii. p. 232 (1865) (*Helichrysum*).

Var. **monocephalum** DC. Prodr. vi. p. 188 (1837).

H. decorum Krauss in Flora 1844, p. 679 ; vix DC.

Huilla.—Broadly cæspitose, very beautiful. In elevated rocky thickets in Morro de Monino, only in a few spots ; fl. April 1860. No. **3495**.

The white wool on the lower face of the leaves in our specimens is often loose and deciduous ; and the stems occasionally bear two capitula.

Var. **nanum** DC., *l.c.*

Huilla.—In very elevated pastures in Morro de Lopollo, root-leaves with flowering stems, April 1860 ; in the same locality with stems 4 to 6 in. high and rather young solitary capitula, only one specimen, May 1860. No. **3496**.

9. **E. Mechowianum** Klatt in Ann. Hofmus. Wien, vii. p. 101 (1892) (*Helichrysum*) ; O. Hoffm. in Bol. Soc. Brot. xiii. p. 24.

Golungo Alto.—A low herb, perennial, with woody rootstock developing its flower-heads before the leaves, after the fashion of some species of *Tussilago* ; flowers golden- or deep-yellow, the capitula occasionally turning reddish. In the more elevated reed-beds among the mountains of Queta, flowering soon after the burning of the plains, plentiful ; leaves, May 1855 and 1856 ; fl. Oct. 1855. No. **3454**. Leaves large, argenteo-tomentose. At Catomba Queimada ; fl. July 1856. No. **3455**.

Huilla.—Flowers yellowish. In bushy rocky pastures near Mumpulla ; fl. Oct. 1859. The radical leaves, which probably appear after the flowers, were not seen here. No. **3456**.

10. **E. stramineum** Hiern, sp. n.

A perennial or possibly biennial herb, with a thick somewhat woody rootstock, 3 to 4 or even 5 ft. high ; stems several ; leaves of the short radical shoots plantaginoid, obovate or oblanceolate, subobtusely pointed and apiculate at the apex, cuneate-attenuate towards the petiolate base, erect, toughly herbaceous, thinly and appressedly woolly on both faces, pale yellowish-tawny beneath, rather darker or greener above, entire, unequally triplinerved at the base with the strong midrib trichotomous near its middle, 5 to 8 in. long by $1\frac{1}{4}$ to $2\frac{3}{4}$ in. broad besides the petiole of 2 to 3 in. long ; upper part of the flowering stems pale-yellowish-tawny or somewhat cinereous, rather slender, loosely branched, thinly and appressedly woolly ; leaves of the branches smaller than the root-leaves, obovate-oblong, apiculate at the apex, the base rather broad and somewhat clasping, entire ; capitula homogamous, narrowly turbinate, straw-coloured, $\frac{1}{3}$ in. long or nearly so, sessile or subsessile or very short bracteolate pedicels, 11- or 12-flowered, several together in small clusters arranged in loosely branched

oblong terminal cymes about 12 in. long by 4 to 6 in. broad; involucral scales pluriseriate, lanceolate or oblong, acute, imbricate, not squarrose, scarious at least on the upper part, the innermost ones the longest, $\frac{1}{3}$ in. long, thinly woolly on the back about the middle, thickened in lower half except the scarious lateral margins; the outer ones successively smaller and more woolly on the back; the outermost ones about $\frac{1}{8}$ in. long; bracteoles similar, small; flowers all hermaphrodite, $\frac{1}{5}$ in. long, the corolla $\frac{1}{6}$ in. long, tubular, shortly lobed, the lobes orange-coloured in the dry state; achene glandular papillose, otherwise glabrous, somewhat angular or compressed; pappus uniseriate, whitish, $\frac{1}{6}$ in. long, setose; the setæ scabrid, connate into a ring at the base, brittle; receptacle narrow, without conspicuous fimbrillæ.

Huilla.—At the clayey sides of the Lopollo stream; fl. and fr. April and May 1860. No. **3479**.

11. **E. Steetzii** O. Hoffm. in Bol. Soc. Brot. xiii. p. 25 (1896) (*Helichrysum*).

Achyrocline Steetzii Vatke in Oesterr. Bot. Zeitschr. xxvii. p. 194 (1877).

Huilla.—A shrublet, 2 to 4 ft. high; branches corymbose; flowers straw-yellow. Humpata and Mumpulla; fl. Oct. 1859. No. **3491**.

This is nearly related to *E. hamulosum* (DC.), but it differs by the obtuseness of the involucral scales.

12. **E. benguellense** Hiern, sp. n.

A slender creamy-white tomentellous undershrub, $1\frac{1}{2}$ ft. high; stems cæspitose, subterete, smooth, the ultimate branches below the inflorescence rather elongated; leaves alternate, linear, rather obtuse at the apex, slightly contracted towards the rather broad sessile base, entire, uninerved, ranging up to nearly 3 in. long, the margins much revolute; capitula homogamous, narrowly conical-oblong, $\frac{3}{16}$ in. long, 5-flowered, glabrous above, loosely woolly at the base, sometimes sparingly sessile-glandular about the middle, sessile or on very short loosely woolly pedicels clustered many together in dense repeatedly branched terminal pedunculate cymes $\frac{3}{4}$ to $1\frac{1}{2}$ in. in diameter; involucral scales imbricate, pluriseriate, glumaceous, creamy-white below, subhyaline above, erect, concave, the outer ones ovate obtuse and very short, the inner ones successively longer, more lanceolate and less obtuse, the innermost ones sublinear, $\frac{1}{6}$ to $\frac{1}{5}$ in. long and subacute; flowers hermaphrodite, $\frac{1}{10}$ in. long; corolla narrowly tubular, minutely sessile-glandular at the back of the lobes; achene glabrous; pappus whitish or of a pale straw colour, setose, uniseriate, the setæ minutely scabrulous; receptacle not fimbrilliferous, small.

Bumbo.—In mountainous rocky places near the Maiombo; in late fl. and fr. Oct. 1859. No. **3493**.

Huilla.—Between Mumpulla and Nene; fl. Oct. 1859. No. **3492**.

13. **E. subglomeratum** Less. Syn. Gen. Compos. p. 283 (1832) (*Helichrysum*); Harv. in Harv. & Sond. Fl. Cap. iii. p. 235 (1865).

Huilla.—Flowers very bright yellow. In elevated bushy pastures, in rocky situations in Morro de Lopollo ; fl. April 1860. No. **3497**. Flowers very bright yellow. In elevated bushy pastures in Morro de Monino ; fl. end of April 1860. No. **3498**.

14. **E. leiopodium** DC. Prodr. vi. p. 200 (1837) (*Helichrysum*) ; Harv. in Harv. & Sond. Fl. Cap. iii. p. 239 (1865).

Huilla.—In the drier bushy pastures annually set on fire in the winter, between Mumpulla and Nene ; fl. Oct. 1859. No. **3472**. At Mumpulla ; fl. and fr. Oct. 1859. No. **3473**. In bushy pastures near Mumpulla ; fl. June 1860. No. **3474**.

This species is very nearly related to *E. nudifolium*, and difficult to be distinguished from it.

15. **E. nudifolium** Less. Syn. Gen. Comp. p. 299 (1832) (*Helichrysum*) ; Harv. in Harv. & Sond. Fl. Cap. iii. p. 240.

Gnaphalium nudifolium L. Pl. Rar. Afr. p. 19, n. 56 (1760).

Ambaca.—An erect herb, apparently perennial, very sparingly branched ; flowers deep yellow. In hilly wooded places near Puri Cacarambola ; fl. Oct. 1856. No. **3476**.

Pungo Andongo.—No notes. Fl. and fr. April 1857. No. **3477**.

Huilla.—In the more elevated pastures, among low bushes, in Morro de Monino, rather rare ; young fl. April 1860. No. **3475**.

16. **E. Mundtii** Harv. in Harv. & Sond. Fl. Cap. iii. p. 243 (1865) (*Helichrysum*).

Huilla.—Rhizome 1 to 3 ft. long, horizontal ; flowers yellowish, nearly whitish. At the banks of the Lopollo river ; fl. beginning of May 1860. No. **3457**.

17. **E. globosum** Schultz Bip. in Mohl & Schlecht. Bot. Zeit. iii. p. 174 (1845) ; A. Rich. Fl. Abyss. i. p. 425 (1847) (*Helichrysum*) ; O. & H. in Oliv. Fl. Trop. Afr. iii. p. 354.

Gnaphalium globosum Schultz Bip., *l.c.*

Pungo Andongo.—An erect, apparently biennial herb, with pallid-yellowish flowers. In rocky sparingly grassy moist parts of Quilombo near the præsidium ; fl. and fr. Jan. 1857. No. **3478**.

30. **STŒBE** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 323.

1. **S. cinerea** Thunb. Prodr. Pl. Cap. p. 169 (1800) ; Harv. in Harv. & Sond. Fl. Cap. iii. p. 284 (1865).

Huilla.—A cæspitose shrub, 2 to 4 ft. high ; involucral scales scarious, not horny ; florets dark purple ; achene sulcate-striate ; setæ of the pappus plumose, connate at the base into a ring. In dry sandy-muddy thickets about Lopollo ; fl. April and May 1860. No. **3482**.

31. **ATHRIXIA** Ker ; Benth. & Hook. f. Gen. Pl. ii. p. 328.

1. **A. feliciodes** Hiern, sp. n.

A low scabrid perennial plant, 2 to 4 in. high, with the aspect of *Phagnalon persicum* Boiss. ; rootstock woody, cæspitosely branched ; stems woody below, wiry ; branches slender, numerous, crowded, spreading and ascending, leafy, angular or very narrowly alate by the decurrence of the leaves, dichotomous ;

leaves linear-spathulate or sublinear, alternate, often crowded and tending to spread or to curve outwards, pointed, sessile, usually very narrowly decurrent, entire, densely scaberulous, uninerved, $\frac{1}{4}$ to 1 in. long, yellowish-green on both faces; the margins narrowly revolute; capitula broadly campanulate, many-flowered, heterogamous, disciform, numerous, pedunculate, $\frac{1}{4}$ to $\frac{1}{3}$ in. broad, terminating the branches, erect; peduncles erect or ascending, scaberulous, ranging up to about $\frac{3}{4}$ in. long, usually bearing one or a few bracts similar to but smaller than the leaves, rather slender; involucral scales multiseriate, narrowly linear-lanceolate, acute and attenuate, the inner rows glabrous or slightly puberulous on the back, uninerved chartaceous pallid, about $\frac{1}{4}$ in. long, erect, the outer rows successively shorter puberulous on the back, more or less spreading or with recurved tips; flowers multiseriate, the outer rows female barren filiform inconspicuous, the corolla of the inner rows tubular, slender, subcylindrical, narrowly funnel-shaped upwards, $\frac{1}{4}$ in. long, shortly 5-lobed, of a whitish-violet colour, tender; anthers tailed at the base, produced at the apex in lanceolate appendages; style-branches of the central flowers tender, exserted, truncate at the apex, not appendaged; those of the barren flowers narrow, shorter; young achenes of the hermaphrodite flowers small, nearly glabrous, with a few short scattered setulæ; pappus white, uniseriate, $\frac{1}{6}$ in. long, the setæ few, nearly smooth, minutely scabrous above, very slender, fragile; receptacle depresso-convex, naked.

Huilla.—In stony pastures between Mumpulla and Nene; fl. and young fr. Oct. 1859. No. **3416.**

This is nearly related to *A. capensis* Ker.

The two following Nos. belong to different species; they should be compared with *Athrixia*, but the specimens are too young for determination:—

Pungo Andongo.—In sandy-earthy moist meadows near Lombe; not yet in fl. March 1857. No. **3378.**

Huilla.—In rather poor sandy wooded meadows between Lopollo and Monino; not yet in fl. beginning of April 1860. No. **3420.**

32. **INULA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 330.

Pentanema Cass. in Bull. Soc. Philom. (May) 1818, p. 74. *Vicoa* Cass. in Ann. Sc. Nat., ser. 1, xvii. p. 418 (1829); Benth. & Hook. f., *l.c.*, p. 334. *Bojeria* DC. Prodr. v. p. 94 (1836); Benth. & Hook. f., *l.c.*, p. 331.

1. **I. indica** L. Sp. Pl., edit. 2, p. 1237 (1763); O. Hoffm. in Bol. Soc. Brot. xiii. p. 26 (1896).

Vicoa auriculata Cass. in Ann. Sc. Nat., ser. 1, xvii. p. 418 (1829); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 362. *V. indica* DC. in Wight, Contrib. Bot. Ind. p. 10 (1834). *V. aurita* DC. Prodr. v. p. 474 (1836). *V. appendiculata* DC. Prodr., *l.c.*

Loanda.—An erect annual herb, with deep-yellow, homogamous capitula. In marshy clayey places, between Bemposta and Camama,

by the Calumbo road; fl. June 1858. Only one specimen. Puberulous; leaves paler beneath, submembranous, sessile. No. **3451**.

Barra do Bengo.—An erect slender annual herb, 1½ to 2½ ft. high; stem reddish, branched, patently ramulose; capitula compact, homogamous, yellow; receptacle convex, tuberculate-papillose. In moist sandy-clayey pastures between Quicuxe and Cacuaco, abundant but only in very few spots; fl. and fr. beginning of Aug. 1858. No. **3449**.

2. **I. glomerata** O. & H., *l.c.*, p. 359; O. Hoffm., *l.c.*, p. 25.

Ambaca.—A handsome perennial plant, 3 to 8 ft. high, and even higher, resembling a *Phlomis* in habit; stem erect, branched, densely clothed, as well as the leaves and floral involucres, with a white-yellowish felt; flowers yellowish. In the more elevated mountainous places near Puri-Cacarambola, not abundant, also near Halo on the left bank of the river Lucala; fl. middle of Oct. 1856. The lower leaves range up to 16 in. long by 6½ in. broad. No. **3453**.

Huilla.—In wooded places at the outskirts of the forest among tall herbage, behind Eme in the direction of Ivantàla; a flowering branch collected in Dec. 1859, and a plant with root-leaves (ranging up to 18 in. long) apparently belonging to the same species in Feb. 1860. No. **3450**.

3. **I. Welwitschii** O. Hoffm., *l.c.*

Huilla.—A tall perennial herb, 3 to 5 ft. high, before the development of the flowers resembling a *Verbascum* in habit; radical leaves often 1½ ft. high, tomentose as well as the strictly erect stem; corolla yellow or yellowish, tubular, shortly 5-cleft, the lobes strictly erect; anther-base acutely tailed; style bulbous at the base, but little or scarcely exserted, the branches short, obtuse, often cohering; achene somewhat pilose, without a callus at the base; pappus uniseriate, setose; the setæ about 15, straight, often quasi-fasciculate at the base. In sparingly bushy pastures between Ferrão da Sola and Jâu; fl. and fr. April and May and end of March 1860. No. **3452**.

4. **I. huillensis** Hiern, sp. n.

A perennial hispid-scaberulous herb, of a yellowish-green colour; stem straight, firm, sulcate-striate, subterete, not winged, pithy, 2½ to 4 ft. high, densely hairy at the base, corymbosely branched above at the inflorescence, hispid with multicellular hairs; lower leaves obovate or narrowly oval, rounded or obtusely narrowed and mucronulate at the apex, more or less narrowed or wedge-shaped at the petiolate or subpetiolate base, membranous, rather paler and less hispid beneath, denticulate, 8 to 10 in. long by 2½ to 3 in. broad, the radical leaves on petioles of 1 to 1½ in. long; the intermediate leaves alternate sessile, more ovate and gradually smaller; the uppermost leaves alternate lanceolate ½ to 1 in. long; capitula homogamous, many-flowered, discoid, subhemispherical, ¾ to 1 in. in diameter, on unequal pedicels ranging up to 4 in. long, arranged in an open rather few-headed terminal corymbose cyme bracteate (or leafy) especially at the divisions; bracts like the leaves but smaller; involucral scales 4- or 5-seriate, scabrid-puberulous at the back at least on the exposed parts, yellowish and rigid except the darker often revolute tips, the inner ones linear-lanceolate, acuminate, equalling the florets,

lacerate-denticulate at the apex, yellow, about $\frac{2}{3}$ in. long, the outer ones successively shorter, broader, densely ciliate and less acute or subulate, the outermost lanceolate- or ovate-oblong, subobtuse, about $\frac{1}{8}$ in. long; florets hermaphrodite, $\frac{3}{8}$ in. long; corollas all narrowly tubular, yellow, very shortly 5-cleft, the tube $\frac{1}{4}$ in. long, glabrous, the teeth deltoid; anthers shortly produced at the apex, the base tailed, the tails long, acutely fringed at the tips; the anthers of the marginal florets apparently sterile; style cylindrical, glabrous, its branches erect, rather rigid, linear spathulate, rounded at the apex, sparingly puberulous; achenes narrowly cylindrical, $\frac{1}{10}$ in. long, many-ribbed, scattered with thin hairs, basal areola oblique; pappus of a pale-straw colour, equalling the corolla, nearly uniseriate, the setæ subequal, densely but very shortly setulose, the setulæ few about the base of the setæ; receptacle convex, not paleaceous, scattered with short acicular setæ.

Huilla.—In wooded meadows, among tall herbage, on the left bank of river near Catumba in the Lopollo country, at 5000 ft. elevation; fl. and young fr. May 1860. No. **3938.**

This plant much resembles in habit *Bojeria speciosa* DC.

5. **I. cuanzensis.**

Porphyrostemma cuanzensis O. Hoffm. in Bol. Soc. Brot. x. p. 174 (1893). *Vernonia cuanzensis* Welw. ex O. Hoffm., *l.c.*

Pungo Andongo.—An annual erect herb, more or less branched or nearly simple; branches erect, rather strict or ascending, monocephalous; flowers purplish. In sandy wooded places from Caghuy towards Sansamanda at the river Cuanza; fl. and fr. beginning of April 1857. No. **3300.**

The capitula are discoid and heterogamous, with the pappus uniseriate straw-coloured and setose in both kinds of florets; the setæ of the pappus are 5 in the case of the female florets and 7 or 8 on the hermaphrodite florets.

33. **PEGOLETTIA** Cass.; Benth. & Hook. f. Gen. Pl. ii. p. 334.

1. **P. senegalensis** Cass. in Dict. Sc. Nat. xxxviii. p. 230 (1825); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 361; J. A. Schmidt, Beitr. Fl. Cap. Verd. Ins. p. 192 (1852).

Mossamedes.—In sandy places on the sides of the mountains near Quipola; fl. and fr. July 1859. No. **3934.** An annual, erect herb, a foot high, with several branches towards the apex; florets tubular, yellow; achenes with pappus and many deep furrows. At the Rio do Sal along the base of Serra de Montes Negros; fl. and fr. 13 Aug. 1859. No. **3935.** An annual herb about 8 in. high; stem ascending, virgately branched towards the apex; florets straw-coloured; style-branches short, erect, lanceolate-subclavate; achenes almost glabrous, marked with several ribs. In sandy bushy places at the mouth of the river Girául; fl. 19 July 1859. Only one specimen. No. **3936.**

Cape de Verde Islands.—An annual herb, 3 in. high; anther-base tailed. On the sandy hills of Praia de Mindello in the island of St. Vincent, sparingly; only one specimen in fr. and a few fl. Jan. 1861. A dwarf form. No. **3408.**

34. **CALOSTEPHANE** Benth.; Benth. & Hook. f. Gen. Pl. ii. p. 335.

1. **C. divaricata** Benth. in Hook. Ic. Pl. xii. p. 11, t. 1111 (1872); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 363.

Geigeria calendulacea Welw. ex O. Hoffm. in Bol. Soc. Brot. xiii. p. 26 (1896).

Mossamedes.—An annual or biennial herb, with the aspect of the Calendulas, 1½ to 2 ft. high, erect or decumbent at the base, dichotomously much-branched; stem winged; branches slender, spreading; leaves pellucid-punctate, decurrent; flowers yellow; capitula heterogamous; ray-florets few, female, uniseriate, ligulate, 3- or 4-toothed; disk-florets hermaphrodite, tubular, 5-lobed, the tube glandular-papillose and obconical below; anthers tailed; receptacle not paleaceous; achenes obcuneate, angular, hispidulous, truncate; pappus biseriate, the 5 outer paleæ short flabelliform and very obtuse, the 5 inner narrower and terminated with a long rough seta after the fashion of the fruit of *Scabiosa*; style-branches lanceolate, compressed. On the sands of the estuary along the banks of the river Bero near the town; fl. and fr. July 1859. Seen also at the river Caroca. No. **3441**.

35. **MOLLERA** O. Hoffm. in Bol. Soc. Brot. x. p. 174 (1893).

1. **M. angolensis** O. Hoffm, *l.c.*

Pungo Andongo.—A slender annual herb; flowers yellow, with spreading rays. In sandy wooded places between Quisonde and Condo; fl. March 1857. No. **3984**.

2. **M. punctulata** Hiern, sp. n.

An erect, scabrid, grey-green, somewhat slender, annual herb, 7 to 11 in. high, simple below, corymbosely branched above; stem and branches narrowly winged by the decurrence of the leaves, moderately leafy throughout; leaves alternate or the lower ones opposite, oblanceolate or sublinear, somewhat narrowed towards the sessile decurrent base, mostly obtuse at the apex, ¼ to 1 in. long, scattered with small black dots, the margins cartilaginous-revolute, dentate along the upper half; capitula heterogamous, radiate, singly terminating the stem and branches, erect, on peduncles ranging up to about ¾ in. long; flowers yellow; involucre hemispherical, about ¼ in. in diameter, its scales sub-biseriate, subequal, free to the base, linear, acute, about 12, hispid and ciliate, minutely glandular; florets of the ray female, fertile, the ligule oblong, ⅛ in. long; florets of the disc shorter, numerous, hermaphrodite, fertile, tubular; corolla-lobes acute; anther-base narrowly caudate; ovary glandular, longitudinally ribbed; pappus 0.

Huilla.—In moist pastures amongst low bushes, near Lopollo; fl. end of March 1860. No. **3976**.

3. **M. huillensis** Hiern, sp. n.

An erect undershrub, 1½ ft. high; stems subterete and nodulose below with the numerous scars of fallen leaves, puberulous and narrowly winged above; leaves alternate, branches numerous, puberulous, striate, leafy, linear or oblanceolate-linear, obtusely pointed at the apex, narrowed attenuated or spathulate towards

the sessile or quasi-petiolate decurrent base, finely herbaceous, minutely toothed on the apical half or subentire, scabrid-puberulous on both sides or minutely punctulate beneath, 2 to 3½ in. long by ⅛ to ⅓ in. broad; capitula heterogamous, radiate, homochromous, yellow, broadly campanulate, ⅓ to ⅜ in. long, many-flowered; involucral scales pauciseriate, imbricate, linear-oblong or -lanceolate, erect subacute, pubescent on the back, not very unequal, ⅙ to ⅓ in. long; receptacle naked; ray-florets female, uniseriate, rather few; ligule puberulous on the back, glabrous on the face, oblong, tridentate at the tip, spreading or recurved; disk-florets hermaphrodite, pluriseriate, numerous, unequal, tubular, mostly exceeding the involucre; corolla puberulous outside, shortly 5-cleft; anthers about equalling the corolla, glabrous, produced at the apex in lanceolate appendages, caudate at the base, the tails slender; style about equalling the corolla, the branches short, lanceolate-linear, somewhat flattened, rounded not truncate at the apex; achenes glabrous or minutely papillose, somewhat angular, short; pappus obsolete, represented by a narrow crenulate or lobulate glabrous ring.

Huilla.—In wooded rocky thickets between Mumpulla and Lopollo or Nene, at an elevation of 4000 to 4500 ft.; fl. and young fr. Oct. 1859. No. **4004**.

36. **GEIGERIA** Griessel.; Benth. & Hook. f. Gen. Pl. ii. p. 337; O. Hoffm. in Bull. Herb. Boiss. i. p. 79 (Feb. 1893).

Thysanurus O. Hoffm. in Engl. & Prantl, Nat. Pflanzenfam. iv. 5, p. 127 (1889).

1. **G. acaulis** Benth. & Hook. f. ex Vatke in Oesterr. Zeitschr. xxv. p. 327 (1875); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 368; non O. Kuntze.

Mossamedes.—On rocky bushy slopes between Pomangala and Quitibe, here and there abundant but the flowers nearly all fallen, beginning of June 1860. No. **3480**. A herb, either annual or probably biennial or triennial according to locality or degree of exposure; stems short, prostrate; leaves narrowly lanceolate, spread out on the ground in a stellate manner; outer involucral scales green at the base, purple at the tip; florets yellow. In rocky places at the banks of the river Bero, rather rare, July 1859. No. **3481**. In hilly mountainous places between Pomangala and Quitibe; fr. Oct. 1895. Coll. Carp. 957.

2. **G. linosyroides** Welw. ms. in Herb., sp. n.

A glabrous or subglabrous shrublet, 6 to 8 in. high; rootstock very thick, perennial, woody, many-headed; stems numerous, erect or ascending, branched at the base or simple, occasionally branching near the apex, slender, wiry, subherbaceous, glabrous, somewhat angular with the narrow decurrence of the leaves, leafy: leaves alternate, sublinear very narrowly elliptical or oblanceolate, subacute, apiculate, sessile, narrowly decurrent, rigid, thickly herbaceous, glabrous or occasionally scattered with a few setulæ, suberect, pale yellowish-green, impressed on both faces with small scattered darker-green points, uninerved or occa-

sionally with the midrib branched a little above its base, flat or nearly so, $\frac{1}{4}$ to 1 in. long, the margin narrowly cartilaginous, entire; capitula heterogamous, radiate, xantho-homochromous, many-flowered, solitary, terminal or subterminal, sessile or subsessile, erect, with a campanulate not turbinate base and a spreading apex; involucre about $\frac{1}{2}$ in. in diameter; involucral scales pluriseriate, imbricate, more or less acute, glabrous at least below, the outermost ones foliaceous, $\frac{1}{4}$ to $\frac{3}{8}$ in. long, the intermediate ones scale-like with terminal foliaceous appendages some of them shorter than the outermost foliaceous ones, the innermost broadly lanceolate, gradually acuminate to an acute apex, wholly scarious, ciliolate on the margin, a little shorter than the florets of the disk; ray-florets few, female, the corolla ligulate, the ligule yellow, spreading, recurved, nerved, tridentate at the apex, style-branches elongated and far-exserted; corolla of the hermaphrodite multiseriate disk-florets tubular, membranous, yellow, 5-cleft, the lobes lanceolate, erect-connivent, truncate-denticulate at the apex; anthers produced at the apex into narrowly lanceolate acute appendages and at the base into filiform tails; style-branches similar to those of the ray-florets, long, slender, almost subulate; achenes of the disk-florets rather short ($\frac{1}{20}$ in. long), somewhat compressed and obconical, wrapped in long ascending pilose hairs; pappus coroniform, consisting of numerous densely contiguous pluriseriate scarious lanceolate very acute somewhat spreading paleæ; areola at the apex of the achene pretty large, bearing in the centre the reddish hemispherical nectary; receptacle depresso-convex, densely fimbrillate with tall setæ.

Huilla.—In sunny situations, among very low bushes, near Mumpulla; fl. and fr. Oct. 1859. No. **3987**.

3. **G. acicularis** O. Hoffm. in Bull. Herb. Boiss. i. p. 82.

Huilla.—A slender heath-like shrub, 2 to 3 ft. high, the whole plant especially the leaves and capitula resinous-viscid; stem straight, naked from the base far up, woody, corymbosely branched towards the apex; capitula homogamous, discoid, yellow; the involucre cylindrical-campanulate, involucrate at the base with the upper stem-leaves; involucral scales pluriseriate, the outer ones broad scarious obtuse and mucronate, the inner ones gradually longer and acuminate, the innermost ones equalling the disk; all erect and imbricate; flowers yellow: corollas all tubular, 5-cleft, flatly compressed; the tube gradually and but little widened from the base, glabrous; the lobes lanceolate, acuminate, strictly erect, connivent and denticulate at the apex; anthers acute and exserted at the tips, tailed at the base, the tails long, simple and subulate; style included, gradually dilated upwards, its branches lanceolate erect flattened and very sparingly puberulous; achenes obconical, rather short, greatly narrowed at the base, densely beset with long slender hairs which invest the pappus at the base; the scales of the paleaceous pappus 10, broad, hyaline, whitish, obtuse or incise-denticulate, 5 of them with and 5 without a long hyaline subulate bristle; receptacle narrow, densely setose. In pastures among low bushes between Mumpulla and Humpata, at an elevation of 4000 ft., abundant; fl. Oct. 1859. No. **3936**.

4. **G. angolensis** O. Hoffm., *l.c.*, p. 85.

Huilla.—A robust, branched, erect or entirely decumbent undershrub or suffruticose herb, 3 to 4 ft. high, with the habit of a *Centaurea*; young stem and branches winged; leaves densely pellucid-punctate, decurrent on the young branches with a broad wing, but the adult stem cylindrical without wings; capitula heterogamous, radiate; involucre invested at the base with 2 or 3 herbaceous leaves; involucral scales pluriseriate, coriaceous, quite glabrous, elongate-ovate, obtusely acuminate, closely imbricate, ciliolate on the margin, the inner ones gradually longer, the innermost ones scarcely shorter than the disk; flowers yellow or yellowish, paleaceous-dry; ligulate florets uniseriate, broadly linear, female, 10 to 15 in each capitulum, truncate and tridentate at the apex; disk-florets hermaphrodite, compressed-tubular, deeply 5-cleft, the segments lanceolate-linear or linear, rigid, strictly erect, truncate and finely denticulate at the apex; anthers long, rather far exserted, terminating at the apex with elongated acuminate-cuspidate straight appendages which are connivent in a cone, caudate at the base, the tails rather long and acute; filaments glabrous, flattened; style of the hermaphrodite florets moderately thickened below its branching, rather pilose, the branches elongated and subulate; achenes short, obconical, covered with long whitish hairs; pappus paleaceous, biseriate, the paleæ of the outer row lanceolate acutely acuminate and shorter than those of the inner row which are broadly ovate-oblong fimbriate at the apex and tipped with a long seta; receptacle moderately convex, densely beset with long whitish fibrillæ. In sandy bushy wooded places from Lopollo towards the forests of Munhino (or Monino), rather rare; fl. and fr. April 1860. No. **3701**. At the outskirts of forests near Catumba; fl.-bud beginning of May 1860. No. **3702**.

5. **G. spinosa** O. Hoffm., *l.c.*, p. 80, and in Bol. Soc. Brot. x. p. 175 (1893).

Mossamedes.—An annual, branched, prostrate herb, with the habit of a *Scolymus*; flowers yellow, fragrant. In gravelly maritime places between Quipola and Giraul, not abundant, fl. July 1859. No. **3994**.

6. **G. Hoffmanniana**.

Thysanurus angolensis O. Hoffm. in Engl. & Prantl, Nat. Pflanzenfam. iv. 5, p. 127 (1889), and in Bol. Soc. Brot. vii. p. 229.

Huilla.—A prostrate perennial herb, with a peculiar habit; root-stock woody, branched; stems several, decumbent; leaves alternate, mostly secund upwards; glandular-punctate on both faces; flowers yellow; outer involucral scales thickly cartilaginous at the base, surmounted above the middle with a foliaceous ovate-lanceolate appendage; corolla densely glandular, deeply lobed, with linear segments; anthers acutely caudate at the base; style included, deeply bifid, glandular-pubescent, with cylindrical-subulate, mostly strongly cohering branches; achenes not ripe. In herbaceous places sometimes flooded in summer, at the outskirts of forests between Lopollo and Catumba, apparently rare; fl. April 1860. No. **3989**.

Dr. O. Hoffmann placed the genus which he established for the accommodation of this species in the tribe Vernoniaceæ, notwithstanding the yellow colour of its flowers; he recognised, however, its agreement with *Geigeria* except the shape of the style. The latter character is not uniform in *Geigeria* as treated here and by Hoffmann: there are long narrow paleæ on the receptacle in the flowers of our plant such as occur otherwise in this genus.

37. **SPHACOPHYLLUM** Benth.; Benth. & Hook. f. Gen. Pl. ii. p. 339.

1. **S. pinnatifidum** O. Hoffm. in Bol. Soc. Brot. xiii. p. 26 (1896).

Huilla.—In thickets flooded in the rainy season, near Empalanca; fl.-bud Dec. 1859 and Jan. 1860. No. **3443**. In drying-up swamps on the right bank of the Lopollo river; fl. April 1860. No. **3442**.

2. **S. candelabrum** O. Hoffm., *l.c.*, p. 27.

Huilla.—Capitula heterogamous, radiate, yellow; style more than usually thick, with short somewhat compressed branches, thickened at the apex; paleæ of the receptacle very tall. In moist places at the outskirts of forests near Catumba and between Mumpulla and Nene and between the latter and Humpata; fl. and fr. Oct. 1859 and May 1860. No. **3444**. Flowers golden-yellow; achenes 4- or 5-angular, truncate, the angles hispidulous; crown of the pappus short, densely paleaceous, with 1 to 3 angles prolonged into brittle setæ. In marshy places at the banks of streams near Lopollo; fl. and fr. Dec. 1859. No. **3981**.

This species approaches closely to the genus *Anisopappus*, and has the aspect of *A. chinensis* Hook & Arn.

3. **S. Welwitschii** O. Hoffm., *l.c.*

Pungo Andongo.—An erect annual herb, 2 to 3 ft. high, with golden-yellow flowers. In open sandy forests along the banks of the river Cuanza, near Mopopo: fl. and fr. 30 April 1857. No. **3985**. This species has the aspect of *S. africanum* O. Hoffm. (*Astephania africana* Oliv. in Hook. Ic. Pl. t. 1506), but it differs by its broader concave scales on the receptacle embracing the florets; the achenes seen by me are very nearly glabrous, and not pilose as stated in Hoffmann's description quoted above.

4. **S. pumilum** Hiern, sp. n.

A scabrid-pubescent or puberulous undershrub; pubescence whitish, crisp, sometimes obsolete; rootstock thick, woody, perennial, branched; stems decumbent or ascending, branched at and near the base, rather slender and wiry above, 3 to 5 in. high in our specimens but apparently they are only young shoots after the burning of the previous stems; branches erect or ascending, slender, leafy below, sulcate-striate; leaves alternate, mostly crowded, narrowly linear or linear-oblanceolate, obtuse at the apex, sessile or the lower ones spathulate-subpetiolate, dull-green, thick, $\frac{1}{8}$ to $\frac{1}{2}$ in. long, ascending or somewhat spreading, the margins entire, involute; capitula broadly campanulate or sub-hemispherical, not turbinate, $\frac{1}{4}$ to $\frac{1}{2}$ in. in diameter, heterogamous, radiate, many-flowered, terminating the erect or ascending peduncular branches; involucral scales pauciseriate, oval-oblong or sublinear, subobtuse, $\frac{1}{6}$ to $\frac{1}{5}$ in. long, subglabrous or ciliolate-fimbriate near the apex, the outer ones somewhat cymbiform below; flowers yellow; ligulate florets uniseriate, female; the ligule exceeding the involucre, oval, plurinerved; disk-florets multiseriate, hermaphrodite, $\frac{1}{5}$ to $\frac{1}{3}$ in. long; the corolla narrowly funnel-shaped from a slender base, glabrous, exceeding the involucre, shortly 5-lobed, the lobes ovate-lanceolate; anthers produced at the apex into lanceolate appendages,

caudate at the base, the tails setiform; style-branches rather short, just exserted, spreading, rather compressed, narrowly subspathulate, rounded at the apex, not appendaged; achenes (not ripe) somewhat compressed, about 4-ribbed, oblong, $\frac{1}{10}$ in. long, setulose; pappus only represented by a ring of setulæ or minute subulate scales at the top of the achenes; receptacle convex, bearing scales about equalling the involucral scales and embracing the florets.

Huilla.—On dry hills among short grasses, near Mumpulla, rather rare; fl. and young fr. Oct. 1859. No. **3415**.

The following No. is very doubtfully placed under this species:—

Huilla.—In rather dry pastures, flooded in summer, near Empalanca; after fl. and fr. end of Jan. 1860. No. **4064**.

38. **ANISOPAPPUS** Hook. & Arn.; Benth. & Hook. f. Gen. Pl. ii. p. 339.

1. **A. angolensis** O. Hoffm. in Henr. Bol. Soc. Brot. x. p. 176 (1893) and xiii. p. 28 (1896).

Huilla.—Flowers yellowish. At Lopollo; fl. and fr. Dec. 1859. No. **3973**.

39. **ODONTOSPERMUM** Neck.; Benth.&Hook. f. Gen. Pl. ii. p. 340.

1. **O. Vogelii** Webb in Hook. Niger Fl. p. 140 (1849); J. A. Schmidt, Beitr. Fl. Cap. Verd. Ins. p. 194 (1852).

Cape de Verde Islands.—A widely cæspitose shrublet, scarcely a foot high, with the habit of the alpine species of *Artemisia*. On the slopes of Monte Verde, in the island of St. Vincent; withered fl. or corollas fallen or fragmentary, end of Aug. 1853. No. **3504**.

Tribe V.—Helianthoideæ.

40. **AMBROSIA** Tournef., L., Benth. & Hook. f. Gen. Pl. ii. p. 354.

1. **A. senegalensis** DC. Prodr. v. p. 525 (1836); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 371.

Prince's Island.—A suffruticose herb, $1\frac{1}{2}$ to 2 ft. high, in habit resembling an *Artemisia*. In the drier sunny part of the island, not far from the sea, at Bahia de Santo Antonio, sparingly; fl. Sept. 1853. No. **3952**.

41. **SIGESBECKIA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 359 (*Siegesbeckia*).

1. **S. orientalis** L. Sp. Pl. edit. 1, p. 900 (1753); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 372; O. Hoffm. in Bol. Soc. Brot. xiii. p. 28 (1896).

Golungo Alto.—An erect herb, 2 to 3 ft. high. In moist places at the outskirts of forests near Menha-Lula; fl. and fr. Feb. and April 1856. No. **3945**. A strictly erect branched herb. At the borders of forests along the banks of the river Delâmboa, in masses but in only a few places; fl. and fr. May 1855. No. **3946**. An annual erect herb, 1 to $3\frac{1}{2}$ ft. high; branches opposite the leaves; flowers small, yellow. Some unilabiate trifid florets were seen with obtuse deflexed lobes, and those of the disk 5-cleft not tubular. By the road towards Menha-Lula,

at the edges of thickets and forests, sporadic; fl. and fr. July 1855. The plant is abundant in the interior of western Africa. No. **3947**.

Cazengo.—An ashy annual herb, 1 to 2½ ft. high; stem erect; flowers small, yellowish; florets labiate trifid; achenes of the ray-florets glandular. At Caculo; fr. June 1855. Coll. Carp. 686.

42. **ECLIPTA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 361.

1. **E. erecta** L. Mant. ii. p. 286 (1771).

Verbesina alba L. Sp. Pl. edit. 1, p. 902 (1753). *V. prostrata* L. Sp. Pl., *l.c.* *E. punctata* L. Mant., *l.c.* *E. alba* Hassk. Pl. Jav. Rar. p. 528 (1848); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 373; O. Hoffm. in Bol. Soc. Brot. xiii. p. 28 (1896). *Ecliptica alba* O. Kuntze, Rev. Gen. Pl. i. p. 334 (1891).

Sierra Leone.—In mountainous pastures about Freetown; fl. and young fr. Sept. 1853. No. **3971**.

Barra do Bengo.—An erect, much branched, annual or biennial herb, with white flowers. In swampy places near Panda, at the river Bengo; fr. Sept. 1857. Coll. Carp. 680.

Loanda.—An annual, much branched herb, with whitish capitula; in drying-up marshes it occasionally becomes biennial or even persists for three years. By marshes about Imbondeiro dos Lobos and near Teba, plentiful; fl. and fr. June 1858. No. **3931**.

Golungo Alto.—About marshes near Undella; fl. and fr. Dec. 1855 No. **3932**.

Prince's Island.—By streams near Bahia de S. Antonio; fl. and fr. Sept. 1853. No. **3930**.

Var. **macrophylla** (Welw. ms. in Herb.).

An erect, adpressedly hispidulous herb, 2 to 3 ft. high; leaves elliptical, ranging up to 5 in. long by 1¾ in. broad or more, 2 or 3 times as long as the peduncles, distantly and coarsely dentate-serrate; flowers white; achenes nearly bald except the apical areola, obtusely tuberculate-verrucose.

Golungo Alto.—In damp parts of Quilombo-Quiacatubia; fl. and fr. Feb. 1855. Only one specimen. No. **3929**.

43. **SCLEROCARPUS** Jacq.; Benth. & Hook. f. Gen. Pl. ii. p. 364.

1. **S. africanus** Jacq. Ic. Pl. Rar. i. p. 17, t. 176 (1781—1786); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 374; O. Hoffm. in Bol. Soc. Brot. xiii. p. 28 (1896).

Golungo Alto.—A herb, 2½ to 4 ft. high; stem straight, purplish, roughly pilose, branched upwards; flowers yellow, axillary. In secondary thickets by the Ambaca road; fl. and fr. Nov. 1855. No. **3940**. Flowers yellowish. At the outskirts of forests near the river Cate; fl. and fr. March 1856. No. **3942**. An annual, erect, branched herb, 1 to 2 or even up to 4 ft. high; leaves not always alternate; capitula heterogamous; flowers yellow; ligules of the ray-florets few, 3 or 4, with a slender tube and an ovate-rounded or obcordate lamina more or less deeply cleft at the apex; disk-florets 5-cleft, stamens and style included. In places neglected after cultivation, near Sange; fl. and fr. June 1856. No. **3941**. Canescent; stem branched; flowers inconspicuous, small, almost hidden by the floral leaves. At the outskirts of forests near the river Cate; fr. March 1856. Coll. Carp. 684.

Cazengo.—At Dalatanda ; fl. and fr. June 1855. No. **3943.**

Mossamedes.—Strigulose. In bushy herbaceous places on the right bank of the river Bero, sporadic ; fl. and fr. end of July 1859. No. **3939.** An annual ascending branched herb ; flowers yellow ; achenes trigonous, gibbous. At Cavalheiros ; fr. July 1859. Coll. Carp. 687.

44. **OMPHALOPAPPUS** O. Hoffm. in Engl. & Prantl, Nat. Pflanzenfam. iv. 5, p. 234 (1890).

1. **O. Newtoni** O. Hoffm., *l.c.*, and in Bol. Soc. Brot. x. p. 177 (1893), and xiii. p. 28 (1896).

Huilla.—An erect herb, 2 to 3 ft. high, with the habit of an *Epilobium* ; stems involucres and florets purple ; capitula homogamous ; florets all tubular, 5-cleft ; anthers shortly cordate ; style compressed, its branches short, flat-concave on the inner face, acutely acuminate ; achenes acutely angular, at the truncate apex the angles running out into teeth, without any other pappus ; receptacle paleaceous. At the herbaceous banks of the Monino stream, amongst willows and species of *Faurea* ; fl. and young fr. Feb. and April 1860. No. **3440.**

45 **WEDELIA** Jacq. ; Benth. & Hook. f. Gen. Pl. ii. p. 370.

1. **W. africana** Pers. Syn. Pl. ii. p. 490 (1807) ; P. Beauv. Fl. Ow. et Benin. ii. p. 19, t. 69 (1810) ; O. & H. in Oliv. Fl. Trop. Afr. iii. p. 376.

Seruneum africanum O. Kuntze, Rev. Gen. Pl. i. p. 365 (1891).

Pungo Andongo.—An erect, sparingly branched undershrub, 2 to 4 ft. high ; leaves membranous, rather rigid, ranging up to 5½ in. long by 1⅜ in. broad ; flowers yellow. In rocky places at the cataracts of streams, Calunda and Tunda Quilombo, *arimo* (cultivated field) of Senhor Salgado, sparingly ; fl. end of Jan. 1857. No. **3567.** Capitula heterogamous ; flowers yellow ; ray-florets 2- or pluri-seriate, the inner row variously shaped, fertile ; central florets hermaphrodite, several of them barren ; anthers turning black, ecaudate ; style-branches circinate, acuminate at the apex ; young achenes of the ray-florets truncate, constricted below the coroniform apex, obscurely angular ; pappus coroniform, delicately fringed rather than toothed. At the Condo cataract of the river Cuanza, sporadic ; fl. March 1857. No. **3568.**

Our specimens differ from the type of the species by shorter peduncles and more numerous capitula ; they should be compared with *W. angolensis* Klatt in Ann. Naturhist. Hofmus. Wien, vii. p. 102 (1892), authentic specimens of which I have not seen.

2. **W. huillensis** Hiern, sp. n.

A wiry herb, 2 ft. high or more ; stems striate, subglabrate, terete ; branches slender, more or less scabrid, strigulose with short pallid hairs, the internodes often longer than the leaves, erect-patent ; leaves opposite, narrowly lanceolate, acute or pointed at the apex, wedge-shaped at the subsessile base, rather rigidly membranous, dull green and strigulose or scabrid above, paler strigose and minutely black-dotted beneath, erect-patent, 1 to 4 in. long by ⅛ to 1 in. broad, distantly serrulate or sub-

repand; capitula heterogamous, radiate, campanulate, about $\frac{3}{8}$ in. long, on short or very short peduncles, 3 to 1 together, terminal; peduncles slender, strigose, ranging up to $\frac{5}{8}$ in. long; involucral scales sub-biseriate, oblong, free to the base, the outer ones the longest, about $\frac{1}{3}$ in. long, strigose on the back, with ovate subfoliaceous tips, subacute or pointed; the inner ones dry, rigid, with ciliate ovate pointed tips, about $\frac{1}{5}$ in. long; flowers yellow; ray-florets uniseriate, ligulate, female, fertile, $\frac{3}{8}$ in. long when straightened, the ovary $\frac{1}{12}$ in. long, somewhat hairy, tipped with a short coroniform unequally fimbriate pappus; the ligula oval, glabrous, nerved, minutely dentate at the tip, $\frac{1}{6}$ in. long, clawed at the base, spreading; disk-florets hermaphrodite, fertile, $\frac{5}{16}$ in. long; the corolla $\frac{3}{16}$ in. long, shortly 5-lobed, glabrous; the anthers partly exserted, dusky, shortly appendaged at the apex, obtuse at the base, ecaudate; the style-branches short, just exserted beyond the anthers shortly appendaged, hairy; the ovary $\frac{1}{12}$ in. long, slightly pilose, subcompressed, ribbed, oblong, surmounted by a short coroniform fimbriate pappus, without aristæ; scales of the receptacle folded, embracing the disk-florets, scarious, $\frac{1}{6}$ in. long.

HUILLA.—In herbaceous places at the outskirts of forests, from Lopollo towards Jâu; fl. March 1860. No. **3566.**

3. **W. albiflora** Hiern, sp. n.

A perennial, erect, branched herb, 3 ft. high; stems numerous, subterete; branches hispid or scabrid, opposite, erect-patent, tawny-brown, rather slender; leaves opposite, ovate or lanceolate, acuminate acute or subobtuse at the apex, obtuse or abruptly narrowed at the hispid shortly petiolate or subsessile base, rigidly membranous, scabrid, shortly hispid-strigose with pale rigid hairs arising from a papilliform base, dull green above, paler beneath, distantly serrulate and narrowly revolute on the margin, 1 to 4 in. long by $\frac{1}{4}$ to 2 in. broad, spreading; capitula heterogamous, campanulate-oblong, $\frac{3}{8}$ in. long, on hispid peduncles ranging up to $1\frac{1}{4}$ in. long, terminal and sub-terminal, forming compound terminal open broad corymbose cymes; involucral scales pauciseriate, imbricate, $\frac{1}{5}$ to $\frac{1}{4}$ in. long, oval-oblong, obtuse, concave, free to the base or nearly so, the outer ones hispid on the back, occasionally bifid, the inner ones rigidly scarious, embracing the outer florets; flowers white; ray-florets radiate, uniseriate, female; the ligule obovate-oblong, 3-nerved, bi-lobed at the apex, clawed at the base, $\frac{1}{12}$ in. broad, together with the claw $\frac{1}{4}$ in. long, the lobes rounded; disk-florets pauciseriate, embraced by the folded scales of the receptacle; the corolla regular, shortly 5-cleft, $\frac{1}{6}$ in. long; anthers dark-brown, equalling the corolla-tube, shortly appendaged at the apex, minutely and obtusely sagittate at the base; style-branches 2, shortly exserted, arching, diverging, furnished with small narrow appendages at the apex, papillose; young achenes somewhat compressedly angular, pilose at least along the angles, pappus coroniform, glabrous except the ciliate-setulose apex, without aristæ.

Pungo Andongo.—In thickets very frequently flooded, near Candumba ; fl. Jan. 1857. No. **3557**.

46. **ASPILIA** Thouars ; Benth. & Hook. f. Gen. Pl. ii. p. 371.

1. **A. Welwitschii** O. Hoffm. in Bol. Soc. Brot. xiii. p. 29 (1896).

Huilla.—Rootstock thick, hard-woody ; stems several, rigid, straight or ascending ; flowers golden-yellow, nearly orange or deep orange in colour ; achenes subcompressed, tetragonal, pubescent on the upper part ; pappus either bi-aristate or bidentate. In pastures amidst tall bushes on the right bank of the Lopollo stream, fl. and fr. Oct. and Nov. 1859 and again in Jan. 1860 ; also in hilly places on a rich soil covered with acacia shrubs, on the right bank of the Lopollo stream, plentiful, fl. and fr. April 1860. No. **3559**.

Var. **serrata**.

Leaves more or less serrate, at least on the upper half.

Huilla.—In thickets near Mumpulla ; fl. Oct. 1859. No. **3560**.

2. **A. bipartita** O. Hoffm., *l.c.*, p. 30.

Pungo Andongo.—A perennial herb ; primary stem rooting below ; capitula heterogamous, yellow ; involucral scales few, rigidly coriaceous, imbricate, biseriate ; ray-florets ligulate, neuter, bifid to the middle, with obtuse lobes ; disk-florets each sheathed with a scarious bract, 5-cleft, with reflexed lobes and somewhat pilose tube ; anthers delicately caudiculate or shortly hastate-aristate at the base, far exserted ; style glabrous, the branches far exserted, circinate, above the middle flattened, somewhat pilose inside not outside, acutely pointed at the apex ; achenes few, thickened on the margin, quadrangular, truncate, glabrous, sometimes tuberculate, with the angles cartilaginous-costate ; pappus coroniform in the centre of the achene, paleaceous. In damp sandy places between Condo and Quisondo ; fl. and fr. March 1857. No. **3564**.

3. **A. trichodesmoides** O. Hoffm., *l.c.*, p. 28.

Pungo Andongo.—A herb with the habit of an *Echium*, *Lycopsis*, or *Cerianthe* ; root tuberous-woody, perennial ; stems numerous, ascending, 1 to 2 ft. high ; flowers from lilac to purple ; achenes precisely similar to those of *A. bipartita* O. Hoffm. (Welw. Herb. no. 3564). In rocky bushy places near Muta-Lucala, only in one spot ; fl. and fr. beginning of March 1857. No. **3565**.

4. **A. helianthoides** O. & H. in Oliv. Fl. Trop. Afr. iii. p. 381.

Golungo Alto.—In swampy places near Camilungo ; without either fl. or fr. March 1856. Nos. **3972** and **3972*b***. For want of sufficient material the determination is doubtful.

5. **A. fontinalis** Hiern, sp. n.

An erect rigid herb or undershrub, 1 to 2 ft. high ; stems striate, simple or nearly so, nearly smooth below, above leafy, obtusely angular, more or less hispid-scabrid with pale hairs arising from a papilliform base ; leaves opposite, ovate or subelliptical, not acuminate, pointed at the apex, obtuse or somewhat wedge-shaped at the subsessile or very shortly petiolate base, rigidly membranous, dull green, scabrid-strigulose above, strigose-hispid and scarcely paler beneath, distantly serrulate, erect-patent, indistinctly triplinerved at or near the base, $1\frac{3}{4}$ to $2\frac{1}{2}$ in. by $\frac{1}{2}$ to

$1\frac{1}{8}$ in. broad; petioles ranging up to $\frac{1}{8}$ in. long, hirsute-hispid; capitula campanulate, about $\frac{1}{2}$ in. long, heterogamous, radiate, solitary, terminal and sub-terminal; peduncles short, ranging up to $\frac{3}{4}$ in. long, hirsute-hispid; involucral scales sub-biseriate, oblong, free to the base; the outer ones hispid on the back, about 5, coriaceous-foliaceous, obtusely pointed at the apex, nearly flat, about $\frac{1}{2}$ in. long; the inner ones rigid, dry, about $\frac{1}{3}$ in. long, glabrous below, terminated at the apex with an ovate pointed ciliate appendage, nearly flat or somewhat convex; scales of the receptacle ovate-oblong, folded, embracing the florets, $\frac{1}{4}$ to $\frac{1}{3}$ in. long; flowers sulphur-yellow; ray-florets uniseriate, ligulate, about $\frac{5}{8}$ in. long, neuter; the lamina about $\frac{1}{4}$ in. long, obovate, tridentate at the tip, spreading; the ovary compressed, linear, slightly hairy, $\frac{1}{8}$ in. long, surmounted with a coroniform shortly bristly pappus; disk-florets nearly $\frac{1}{2}$ in. long, hermaphrodite, the corolla tubular, shortly lobed; anthers minutely sagittate at the base; style-branches short, rather flattened, broadly rounded at the apex, hairy, not appendaged; ovary $\frac{1}{7}$ in. long, somewhat compressed, linear, hairy-setose; pappus cupuliform, shallow, broader than the top of the ovary, persistent, exaristate, scattered with a few whitish setæ, fimbriate at the apex with very short slender teeth; achenes oblong, obtusely angular-compressed, about $\frac{1}{5}$ in. long, scattered with short hairs.

Pungo Andongo.—In the Panda forest near Condo, close to the cataract of the river Cuanza; fl. and fr. 15 March 1857. No. **3558**.

6. **A. Kotschyi** Benth. & Hook. f. ex Oliv. in Trans. Linn. Soc. xxix. p. 98 (1873); O. & H., *l.c.*; O. Hoffm., *l.c.*, p. 30.

Golungo Alto.—An annual herb, 2 to 3 ft. high, resembling a *Lycopsis* in habit and in the colour of the atro-purpureous flowers. In level fields and amongst thickets in rather barren places near Bango, Sange, Cambondo, etc.; fl. and fr. from May to July 1855. No. **3561**. In reed-beds (capinaes) at the outskirts of primitive forest of Quisucula, abundant; fl. and ripe fr. April 1856. No. **3562**. In rather dry hilly places by the river Delamboa: fl. and fr. May 1856. No. **3563**. An annual or biennial herb, 2 to 4 ft. high; flowers like those of a *Zinnia*, but black-purple velvety. About Sange and Quisucula; fr. May 1856. Coll. Carp. 666.

47. **MELANTHERA** Rohr; Benth. & Hook. f. Gen. Pl. ii. p. 377.

1. **M. Brownei** Schultz Bip. in Flora, 1844, p. 673; O. & H. in Oliv. Fl. Trop. Afr. iii. p. 382; Ficalho, Pl. Uteis, p. 208 (1884).

Buphthalmum scandens Schum. & Thonn. in Danske Vidensk. Selsk. iv. p. 166 (1829). *Lipotriche Brownei* DC. Prodr. v. p. 544 (1836). *Amellus scandens* O. Kuntze, Rev. Gen. Pl. i. p. 306 (1891).

Golungo Alto.—A subscandent herb, 3 to 4 ft. high; flowers large, deep-yellow, with the florets of the disk paler; ray-florets flattened, quite patent, nerved, emarginate-denticulate at the apex; achenes shortly obcuneate, more or less compressed, obtusely 3- or 4-angular, smooth; pappus consisting of 7 to 9 unequally long very brittle bristles. In elevated thickets among the Queta mountains above N-delle, in company with *Napoleonæa imperialis* P. Beauv.; fl.

and fr. middle of May 1856. No. **3552**. Scandent; flowers golden-yellow. Bango, Queta; fl. and fr. June 1856. No. **3553**. The local name "N-garacaça" is applied to this and also to other species.

The following No. has smaller capitula (about $\frac{1}{3}$ in. long) and petioles rather shorter ($\frac{3}{4}$ to $1\frac{1}{2}$ in. long) than the two previous:—

Golungo Alto.—A herb 4 to 5 ft. high; stem more or less flexuous, climbing among shrubs. In dense thickets near stream Quibôlo among the mountains of Queta, sparingly; fl. 19 March 1856. No. **3549**.

O. Kuntze, *l.c.*, p. 305, has reduced this genus to *Amellus* P. Br. (1756), non L. (1759); but P. Browne's plant, though considered congeneric by R. Brown in Trans. Linn. Soc. xii. part 1, p. 117 (1817), is not included in *Melanthera* as now limited. The person after whom the above species was named is (notwithstanding the spelling) R. Brown and not P. Browne.

2. **M. varians** Hiern, sp. n.

An erect or ascending or subscandent herb, $\frac{3}{4}$ to 4 ft. high, annual, scabrid; stems erect or prostrate or almost climbing, more or less branched; branches opposite, rather slender, furrowed, more or less angular, rough, strigulose towards the apex; leaves ovate or oval-ovate, opposite, pointed or shortly acuminate at the apex, obtuse or abruptly narrowed at the base, more or less dentate, sometimes hastate-lobulate near the base, rigidly membranous, rough with whitish strigulose hairs which leave on the surface rough bases, $\frac{3}{4}$ to $3\frac{1}{2}$ in. long by $\frac{1}{4}$ to 3 in. broad; petioles ranging up to nearly an inch long; capitula heterogamous, radiate, homochromous, hemispherical, $\frac{1}{4}$ to $\frac{1}{3}$ in long, on unequal rather slender hispidulous peduncles ranging up to 3 in., subsolitary or paniculate, arranged in open somewhat leafy terminal corymbose or rounded cymes; involucral scales biseriate, free to the base; the outer ovate with a green lanceolate upper part, strigulose on the back, imbricate at the base, nearly flat, about $\frac{1}{6}$ in. long; the inner ones subscarious, whitish and oblong below, substramineous ovate and ciliolate above, about as long as the outer ones, concave and partly embracing the ray-florets; flowers yellow; ray-florets uniseriate, ligulate, female, fertile; the ligule deep-yellow, exceedingly variable in size; the ovary subcompressed but somewhat trigonous, slightly hairy on the angles, widening a little upwards, with a shortly hairy ring around the apex and 3 unequal scabrid deciduous aristæ at the top of the angles the longest of which is as long as the ovary; disk-florets pluriseriate, $\frac{1}{4}$ in. long, tubular, regular, with the ovary similar to that of a ray-floret but subglabrous and usually more compressed and with 2 or 3 aristæ all but 1 very caducous, embraced by the scales of the receptacle which are similar to the inner involucral scales marked with several parallel lines and at length become flatter; anthers fuscous, ecaudate, obtuse at the base, appendaged at the apex; achenes dusky, roundedly trigonous but slightly compressed, thicker upwards, minutely dotted, subtruncate, nearly glabrate; pappus obsolete or with the remains of a whitish ring around the top.

Barra de Bengo.—In swampy places by the river Bengo; fl. and fr. Dec. 1853. No. **3544**.

Golungo Alto.—By thickets and in the less dense forests; roadway near Menha-Lula; fl. and fr. July 1855. No. **3545**. In bushy wooded parts of Sobato de Mussengue; fl. and fr. May 1856. No. **3546**.

Mossamedes.—Florets golden-yellow. In sandy thickets at the river Bero; fl. July 1859. The ovary of the disk-florets is more rounded than in the three previous Nos. No. **3543**.

3. **M. monochæta** Hiern, sp. n.

A scabrid herb, more or less branched, 1 to 3½ ft. high, apparently annual; stems angular, sulcate, pallid, suberect or subscandent and loosely rambling among shrubs, mostly dichotomous; branches opposite or alternate; leaves ovate or the upper ones lanceolate, acuminate or pointed at the apex, obtuse or more or less wedge-shaped at the base, opposite or sub-opposite or the upper ones alternate, membranous, dark green in the dried state, above rough and scattered with whitish deciduous short strigose-hispid hairs, paler sometimes sublepidote and similarly strigose-hispid beneath, unequally serrate-dentate, occasionally lobulate at or near the base, ⅝ to 4 in. long by ¼ to 2½ in. broad; petioles ranging up to ½ or ¾ in. long, hispidulous; capitula heterogamous, radiate, subhemispherical, ⅛ to ⅜ in. long, on hispidulous peduncles ranging up to about 3 in., terminal and subterminal, together forming broad rather lax terminal leafy cymes; involucral scales free to the base, rather loosely imbricate, sub-biseriate, the outer ones lanceolate-oblong, foliaceous, entire, obtusely pointed, hairy on the back, about ⅛ in. long, nearly flat; the inner ones rather narrower, more acute, nearly as long and less foliaceous; flowers homochromous, yellow; ray-florets ligulate, female, fertile, sub-uniseriate, ⅛ in. long; the ligule oval, ⅜ in. long by ⅛ in. broad, marked with several slender nerves, minutely trifid at the apex, the ovary compressed, puberulous, subtruncate, on one side furnished with an arista; disk-florets multiseriate, hermaphrodite, ⅛ or nearly ¼ in. long (including the exserted style); the corolla about ⅛ in. long, tubular, shortly 5-lobed; anthers about equalling the corolla-lobes, style slightly thickened upwards to its appendage at the apex, ecaudate and obtuse at the base, branching; style-branches somewhat compressed, with an ovate appendage; ovary as in the ray-florets but rather larger; achenes ⅛ in. long, obpyramidal-oblong, 3- or 4-gonal, muriculate verrucose or nearly smooth, turning dusky, truncate and hispidulous at the apex with the remains of the nectary in the centre; pappus consisting of a single caducous scabrid arista, the points of attachment of which for the several florets form a spiral arch; receptacle convex, furnished with paleæ; the paleæ folded and embracing the florets, about 5/16 to ⅛ in. long, dry, subscarious, obovate and whitish below, acuminate and yellowish above, hairy along the line of fold at the back, ciliate along the upper half, marked with several parallel longitudinal lines, persistent.

Loanda.—An annual, subscandent herb. In thickets near Quicuxe;

fl. and fr. July 1858. No. **3547**. An apparently annual herb; stem suberect or frequently quasi-scandent among bushes; leaves bright green in the living state. In dry and also in damp thickets between Teba and Quicuxe; fl. and fr. August 1858. No. **3548**.

Benguella.—By thickets along the river Cotumbella on the side of the town of Benguella, sporadic; fl. and fr. June 1859. No. **3550**.

Mossamedes.—In gravelly bushy places along the banks of the river Bero, at Quipola; fl. and fr. June 1860. No. **3551**.

The above Nos. from the district of Loanda differ from the others, which must be considered the type of the species, by rather smaller capitula, also by less truncate achenes (No. 3548), or by the presence of a hairy ring at the top of the otherwise glabrous ovary in addition to the solitary arista (No. 3547); they perhaps belong to distinct species.

4. **M. scaberrima** Hiern, sp. n.

An undershrub, densely wooded at the base, sub-herbaceous above, rather rigid throughout, 2 to 4 ft. high; wood yellowish; branches erect-patent, obtusely angular, sulcate, strigulose-scabrid, pallid; leaves opposite or ternate, ovate, acuminate or very acute at the apex, rather abruptly narrowed at the base, very scabrous with short stiff pale hairs arising from a papilliform base, deep green above, paler beneath, rigidly coriaceous, sharply serrate except near the apex and base, strongly nerved beneath, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long by $\frac{3}{5}$ to $1\frac{1}{4}$ in. broad; petiole $\frac{1}{8}$ to $\frac{1}{4}$ in. long; capitula sub-hemispherical, $\frac{1}{3}$ to $\frac{1}{2}$ in. in diameter, on peduncles or pedicels ranging up to 3 in. long, arranged in a lax terminal bracteate or somewhat leafy terminal corymb about 5 in. in diameter; involucral bracts pauciseriate, imbricate, dry, coriaceous, rigid, strigose-hispid on the exposed part of the back, smooth and shining inside, about equally long, the outer ones lanceolate, the inner ones obovate-oblong with a lanceolate ciliate upper part, the innermost (or outer scales of the receptacle) cymbiform and embracing the outer florets; flowers golden-yellow, smaller than those of *M. Brownei*; ray-florets female, about $\frac{3}{8}$ in. long, uniseriate; the ligule oval, $\frac{1}{4}$ in. long, minutely tridentate at the apex, puberulous on the back, glabrous on the front, many-nerved; disk-florets pluriseriate, $\frac{1}{8}$ in. long, with a regular shortly 5-cleft corolla; anthers included, black with pale connectives and apical ovate appendages, obtuse and minutely sagittate at the base; style included and about equalling the anthers or shortly exserted, bifid, the branches pilose with narrow lanceolate appendages; achenes angular, somewhat compressed, narrowed towards the base, glabrous, truncate at the apex; pappus not coroniform, consisting of several (10 to 13) unequal, deciduous, rigid, minutely scabrid, ochroleucous aristæ, some longer and some shorter than the achene; receptacle narrow, convex, furnished with scales similar to the inner involucral scales, some nearly flat and subtending, others folded and embracing the florets.

Pungo Andongo.—In the drier thickets between Quilanga and Luxillo; fl. Feb. 1857. No. **3556**.

5. **M. cuanzensis** Hiern, sp. n.

A perennial herb; stem 2 to 4 ft. high, mostly decumbent on neighbouring shrubs, subscandent, pallid, 4-angular, furrowed, puberulous; branches few, lax, opposite, scattered with whitish short scurfy hairs and a few short strigulose hairs intermixed, scarcely scabrid; leaves opposite, spreading, lance-shaped, rather obtuse and minutely mucronate at the apex, broadly cordate or subreniform at the base, membranous but rather rigid, rather distantly crenulate-denticulate, scabrid scattered with short whitish strigulose hairs and deep green above, rather softly strigulose paler and reticulate beneath, $1\frac{1}{4}$ to $5\frac{1}{4}$ in. long by $\frac{3}{8}$ to $1\frac{1}{2}$ in. broad or rather longer; petiole $\frac{1}{2}$ to 1 in. long, strigulose with short whitish hairs, scarcely scabrid; capitula hemispherical, radiate, heterogamous, homochromous, about $\frac{3}{8}$ in. long, opposite or alternate, axillary or terminal, on peduncles 3 to 6 in. long; involucral scales pauciseriate, imbricate, free to the base, ovate pointed and strigose on the back or the innermost ones oblong and acuminate, ciliate, flat, the outermost ones rather the shortest; flowers wholly golden-yellow; ray-florets about $\frac{7}{8}$ in. long, uniseriate, female, fertile, subtended by the innermost scales of the involucre, ligulate; the ligule oblong, $\frac{3}{8}$ in. long, marked with several parallel longitudinal nerves, bifid at the apex, glabrous above, pilose along the nerves beneath; style bifid; the ovary compressed-subquadrangular, puberulous along the lateral edges, otherwise glabrous or minutely puberulous obovate, $\frac{1}{16}$ in. long, subtruncate at the apex, tipped with about ten scabrid somewhat unequal erect pale aristæ which arise from a ring at the apex smaller than the breadth of the ovary; disk-florets multiseriate, tubular, regular, $\frac{1}{4}$ in. long, hermaphrodite; the corolla $\frac{1}{6}$ in. long, puberulous outside, with 5 short ovate-deltoid lobes; the anthers dusky, with pale ovate appendages at the apex, ecaudate and obtuse at the base; style-branches rather short, somewhat compressed, with short pointed appendages at the apex; ovary $\frac{1}{12}$ in. long, compressed-quadrangular, oblanceolate, puberulous along the sides and around the apex, scattered with minute hairs or glabrous elsewhere, subtruncate at the apex, tipped with about 10 to 15 unequal scabrid pale aristæ more or less equalling the ovary in length and arising around or from the apex of the ovary; achenes obversely pyramidal, slightly compressed, angular, glabrate except the somewhat rounded or subtruncate apex, $\frac{1}{12}$ in. long; pappus consisting of several erect pallid scabrid more or less deciduous aristæ which equal or exceed the achene in length and arise about a thickened ring narrower than the whole achene; receptacle convex, furnished with obovate-acuminate scabrid-ciliolate folded scales which embrace the disk-florets and are marked with parallel longitudinal lines.

Pungo Andongo.—By wooded thickets along the right bank of the river Cuanza; fl. and fr. Dec. 1856. No. **3554**.

Var. **altior.**

A herb, 5 to 7 ft. high; stem quadrangular, weak, sparingly branched, with fibrous adventitious roots at the base; leaves less excavated at the base than in the type of the species.

PUNGO ANDONGO.—By streams in the wooded parts of Sobato Cabanga, growing in masses; fl. and fr. Jan. 1857. No. **3555.**

48. **SPILANTHES** Jacq.; Benth. & Hook. f. Gen. Pl. ii. p. 380.

1. **S. oleracea** L. Syst. Nat., edit. xii., Veg. p. 534 (1767) (*Spilanthus*); Jacq. Hort. Vindob. (ii.) p. 63, t. 135 (1772).

Verbesina Acmella L. Sp. Pl. edit. 1, p. 901 (1753). *S. Acmella* L. Syst. Veg., edit. Murr., p. 610 (1774) (*Spilanthus*); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 384; O. Hoffm. in Bol. Soc. Brot. xiii. p. 31 (1896). *Ceratocephalus Acmella* O. Kuntze, Rev. Gen. Pl. i. p. 326 (1891).

SIERRA LEONE.—A herb, 9 to 12 in. high; stem decumbent, rooting; branches slender, erect; capitula conical-ovoid, radiate; achenes black, truncate, with 2 setæ. In damp meadows by marshes near Freetown; fl. and fr. Sept. 1853. No. **3969.**

BARRA DO DANDE.—An annual or biennial prostrate herb; stem creeping, rooting here and there at the nodes; leaves membranous, ovate, repand or almost entire; capitula axillary, pedunculate: involucral scales herbaceous-green; disk-florets milk-white; anthers turning black; achenes compressed, smooth on the sides, obovate, turning black, the edges each terminating in a rather long subulate arista, the margin sometimes ciliolate or with very unequal aristæ. In only one damp grassy spot on the right bank of the river Dande, plentifully; fl. and fr. Sept. 1858. A luxuriant form. No. **3970**, and COLL. CARP. 664.

PUNGO ANDONGO.—An annual herb; stem decumbent, rooting at the nodes; branches and branchlets ascending, nearly glabrous; capitula pauciradiate, yellow but with the ligules paler and occasionally becoming nearly white; the ray-florets female, fertile, ligulate, narrowly obovate, obtuse; the disk-florets tubular, 4-cleft, with deltoid spreading lobes; achenes compressed-triquetrous, with two of the angles acute and spinulose-ciliate and the third (the inner one) obtuse or obsolete, truncate, with the angles terminating in short setulæ or nearly bald; involucral scales lanceolate from a broad base, almost as long as the capitulum or but little shorter, persistent. In only one spot by the Cazella rivulet near the town, plentifully; fl. and fr. Nov. 1856. No. **3968.**

The three Nos. here referred to the above widely distributed species greatly vary; they were each considered by Welwitsch to constitute new species.

49. **SYNEDRELLA** Gaertn.; Benth. & Hook. f. Gen. Pl. ii. p. 383.

1. **S. nodiflora** Gaertn. Fruct. ii. p. 456, t. 171, f. 7 (1791); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 386.

SIERRA LEONE.—Fr. Sept. 1853. No. **3983.**

50. **COREOPSIS** L.; Benth. & Hook. f. Gen. Pl. ii. p. 385.

1. **C. Steppia** Steetz in Peters, Mossam. Bot. ii. p. 496 (1863); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 388.

Golungo Alto.—A herb, 3 to 5 ft. high; stem simple below, branched from the middle to the apex; leaves lobed after the fashion of *Franseria artemisioides* Willd.; flowers orange-yellow, handsome. In moist sandy reed-beds between Camilungo and Canaûlo, by the Ambaca road; fl. beginning of April 1856. No. **3532.**

Pungo Andongo.—A rigid herb, 18 in. high, sparingly hirsute, root apparently annual, somewhat woody; branches opposite, divaricate. At Luxillo, without either fl. or fr. Feb. 1857. A poor specimen, resembling this species. No. **3533.** No notes. Fl. No. **3534.**

Huilla.—Flowers yellow. In wooded meadows between Eme and lake Ivantâla, rather rare; fl. Jan. 1860. No. **3530.** At the outskirts of the forest near the lake Ivantâla in bushy meadows amongst tall herbs by the river Cacolovar; fl.-bud Feb. 1860. Also near the Lopollo stream. No. **3531.**

The above specimens do not agree perfectly with the type, and, if correctly referred, extend the character of the species to include bipinnatisect foliage; Nos. 3531 and 3532 have markedly hispid stems.

2. **C. speciosa** Hiern, sp. n.

An erect robust smooth herb, with the aspect of a *Chrysanthemum*, 5 to 7 ft. high, or in poor soils only 3 to 4 ft., annual or biennial or lasting for several years, branched towards the apex, glabrate below; stem straight; branches opposite or alternate, more or less quadrangular, erect-patent, thinly pubescent upwards; leaves mostly opposite, tripartite or undivided, ovate in outline, apiculate and obtuse or scarcely acute at the apex, petiolate or subsessile, rigidly membranous or coriaceous, deep-green, glabrate or beset with very short hispid or strigulose hairs on both sides, coarsely and unequally dentate with narrowly revolute or cartilaginous margins and apiculate teeth, 2 to 5 in. long by 1 to 3 in. broad or larger; petioles flattened, sheathing at the base, connate, ranging up to 1 in. long; the lobes ovate or elliptical, the terminal one the largest, the lateral ones spreading; capitula heterogamous, radiate, very large, 3 to 4 in. in diameter, $\frac{2}{3}$ to $\frac{3}{4}$ in. high, solitary and terminal or singly terminating the stem and branches together forming open somewhat leafy terminal cymes, the peduncles ranging up to 4 in. long (or longer and furnished with leaf-like bracts); involucre about 1 in. in diameter; the scales biseriate or subtriseriate, broadly lanceolate or lanceolate-oblong, suberect, rather thick, loosely imbricate, rather exceeding the disk-florets, more or less beset on the back with short broad-based hispidulous hairs; flowers golden-yellow, very handsome; outer florets ligulate, female and barren or neuter, uniseriate, 10 to 18, widely spreading as in *Helianthus*, the ligule elongated, linear-elliptical, 1 to $1\frac{1}{2}$ in. long, marked with numerous dusky longitudinal lines; disk-florets pluriseriate, tubular, hermaphrodite; the corolla glandular-pilosulous, $\frac{1}{5}$ to $\frac{1}{4}$ in. long, its limb gradually widened upwards, 5-lobed at the apex; its lobes ovate-acuminate or elongate-triangulate, rather thick or fleshy, densely granular inside, reflexed on the margin; anthers partly exserted, glabrous, appendaged at the apex, minutely sagittate at the base, scarcely

caudate; filaments thickened near the apex up to the insertion of the anthers; style bulbous at the base, its branches towards their exserted tips thickened, pilosulous, and surmounted by cylindrical narrower tender rather fleshy tolerably long appendages; achenes none winged but flatly compressed, black, subemarginate at the apex, surmounted in the hollowed centre by a dense hairy ring of setulæ, those of the ray without and those of the disk with two aristæ continuous with the densely ciliate-hispidulous edges; the whole achene about $\frac{1}{2}$ in. long, elongate, linear-oblong, slightly or scarcely widened above the middle, longitudinally striate, marked on one side with a prominent nerve or angle; the aristæ pallid, about $\frac{1}{10}$ in. long, erect-patent, beset with erect-setulæ at the base, glabrous above, subulate, persistent; receptacle broad, somewhat convex, furnished with lanceolate- or linear-oblong obtuse dry erect flat scales, which subtend the disk-florets, measure $\frac{1}{3}$ to $\frac{2}{3}$ in. long, have scarious edges, and are marked with 3 to 5 parallel nerves.

Ambaca.—Leaves coriaceous. By thickets from N-gombe in the direction of Puri-Cacarambola, not abundant; not yet in full fl. Oct. 1856. No. **3537**.

Pungo Andongo.—In thickets near Caghuy et Quilanga; fl. Jan. 1857. No. **3538**. Plant dried with great difficulty. In sunny thickets and in wooded places around and within the fortress, abundant; fl. March 1857; also near Quitage at the river Cuige, not yet fl. March 1857. No. **3535**. In open wooded situations, especially near Sansamanda, plentiful; fl. 1 May 1857. No. **3536**.

Nearly related to *C. kilimandscharica* O. Hoffm. in Engl. Bot. Jahrb. xx. p. 234 (1894).

The following plant perhaps belongs to *C. speciosa*, though the capitula are smaller with more hairy involucres, the foliage of the flowering shoots is more densely clothed beneath with short hairs, and the achenes are shorter :—

Ambaca.—A herb, 2 to 3 ft. high; ligules of the ray-florets long, brilliant, deep yellow. At the left bank of the river Caringa, very rare; fl. and fr. June 1855. No. **3272**, partly.

3. **C. ambacensis** Hiern, sp. n.

An erect, loosely branched herb, 2 ft. high or more; stem and branches more or less angular and furrowed, nearly glabrate below, striate and puberulous above with thick weak pallid hairs; leaves opposite or the upper ones sometimes alternate, much divided, ovate in outline, about $2\frac{1}{2}$ in. long by $1\frac{1}{2}$ in. broad or rather larger, more or less pubescent with narrow or small ultimate segments; the lobes tipped with cartilaginous not setaceous points; the common petiole short, dilated and clasping at the base; capitula sub-hemispherical, $\frac{1}{2}$ to $\frac{2}{3}$ in. long, solitary, terminating the stem and branches, on unequal peduncles ranging up to several inches, together forming open somewhat leafy terminal cymes; involucral scales pauciseriate, oval or oblong, obtuse, the outer ones beset with thick tapering pallid hairs on the back; receptacle convex, furnished with narrowly oblong

flat glabrous rigid pallid lined scales $\frac{3}{8}$ to $\frac{1}{2}$ in. long subtending the disk-florets; achenes of the disk-florets linear-oblong, dusky, compressed, somewhat and unequally quadrangular, not winged, hispid-setulose along the angles, exaristate, somewhat muriculate, bidentate and setulose at the apex with two short teeth setulose at the base with erect setulæ; achenes with a circular pallid basal callus narrower than the middle of the achene.

Ambaca.—At the left bank of the river Caringa; fr. June 1855. No. **3272**, partly.

51. **BIDENS** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. p. 387.

1. **B. pilosus** L. Sp. Pl., edit. 1, p. 832 (*pilosa*); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 392; O. Hoffm. in Bol. Soc. Brot. xiii. p. 31 (1896).

Golungo Alto.—In sunny situations near Sange; fl. and fr. Feb. and April 1855. No. **3962**. At Sange; fl. and fr. Dec. 1855. No. **3959**. In the ascent to the Capopa spring, very plentiful; fl. and fr. Jan. 1855 and March 1856. No. **3961** partly.

Huilla.—Flowers yellow. At the outskirts of the Monino forests, amongst tall herbs, sporadic; fl. and fr. end of Jan. 1860. No. **3960**.

2. **B. bipinnatus** L., *l.c.* (*bipinnata*); O. & H., *l.c.*, p. 393.

Pungo Andongo.—An annual herb, with yellowish flowers. Amongst herbs near the præsidium; fl. and fr. May 1857. No. **3961** partly. Also No. **3963**.

3. **B. croceus** Welw. ex O. Hoffm. in Bol. Soc. Brot. x. p. 177.

Huilla.—A glabrous, perennial herb; rhizome with cylindrical tubercles; stems 2 or 3 from the same rootstock, straight, 2 to 3 ft. high, trichotomously branched in the upper part; leaves multisect almost after the fashion of a *Ferula*; the segments linear, rather thick, green-glaucescent, 1 in. long by $\frac{1}{24}$ in. broad, entire on the margin, uninerved; capitula homogamous, twice or thrice as thick as in the previous species of the genus; flowers saffron-coloured; corolla rather fleshy but rigid; achene truncate, not rostrate, surrounded at the apex with a thickened very delicately ciliolate border, tipped with 2 aristæ. In wooded meadows around the great lake of Ivantála, not uncommon; fl. and fr. end of Feb. 1860. A great ornament to the meadows, and a plant well worth cultivating; it has the habit of an American species. No. **3964**.

4. **B. (?) andongensis** Hiern, sp. n.

An erect herb, glabrous throughout or nearly so; rootstock woody, perennial; stems simple below, a little branched above, subterete; internodes $1\frac{1}{4}$ to $2\frac{1}{2}$ in. long; leaves opposite, undivided or scarcely lobed, elliptical or ovate, subobtusely narrowed at the apex, wedge-shaped towards the base, between fleshy and membranous, minutely punctulate-scaly when dry, coarsely and unequally dentate or occasionally lobulate, subglaucescent, petiolate or the upper ones sessile, $\frac{3}{4}$ to $2\frac{1}{2}$ in. long by $\frac{3}{8}$ to $1\frac{3}{4}$ in. broad; petioles ranging up to $\frac{3}{4}$ in., alate upwards with the decurrent leaf-blade, dilated connate and shortly sheathing at the base; capitula heterogamous, radiate, about 2 in. in diameter including the spreading ligules, solitary, on peduncles of 2 to $7\frac{1}{2}$ in., terminal; involucral

scales sub-biseriate, lanceolate-oblong, subobtuse, the outer ones about $\frac{2}{5}$ in. long, the inner ones about $\frac{1}{2}$ in. long; flowers golden-yellow; the ray-florets numerous, nearly 1 in. long, female or some hermaphrodite, apparently barren, with linear-oblong lined ligules about $\frac{3}{4}$ in. long clawed at the base; disk-florets pluriseriate, hermaphrodite, fertile, about $\frac{1}{2}$ in. long; the corolla tubular, regular, about $\frac{1}{3}$ in. long, shortly 5-lobed, rather abruptly contracted for the lowest third part from the insertion of the filaments, the lobes lanceolate-triangular; anthers with lance-shaped exserted appendages at the apex, obtuse at the base; filaments pale-yellow, shorter than the anthers, abruptly thickened and orange-coloured near the apex; style-branches exserted, spreading rather beyond the breadth of the corolla, flattening towards the apex with a triangular appendage or tip; ovary compressed, linear-oblong, somewhat ciliolate on the edges, ciliate-setulose around the apex, otherwise glabrous, tipped with 2 lateral erect retrorsely barbed aristæ about $\frac{1}{6}$ in. long.

Pungo Andongo.—In sandy bushy places near Quibinde, not far from the river Cuije; fl. March 1857. A unique specimen. No. **3529**.

A drawing of the specimen in the study set exists in the British Museum, but the scales of the receptacle are not shown, and therefore the determination of the genus is uncertain.

52. **CHRYSANTHELLUM** Rich.; Benth. & Hook. f. Gen. Pl. ii. p. 389.

1. **C. procumbens** Pers. Syn. Pl. ii. p. 471 (1807); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 395.

Anthemis americana L. Sp. Pl., edit. 1, p. 895 (1753), non Mutis. *Bidens apiifolia* L. Syst. Nat., edit. 10, ii. p. 1203 (1759). *Verbesina mutica* L. Sp. Pl., edit. 2, p. 1273 (1763), non Sieber.

Golungo Alto.—An annual herb, at first erect with one or few capitula, afterwards prostrate, much branched with the basal branchlets prolonged and very crowded; flowers yellow, slightly aromatic. In rather dry sunny shortly grassy situations at Sange, in neglected gardens, etc.; the erect form in Dec. 1854, becoming prostrate in July 1855; fl. and fr. No. **3957**. Resembling a fine specimen of *Soliva nasturtiifolia* DC. Seeds, August 1855. Coll. Carp. 668. A dwarf, much branched, annual weed, with yellow flowers, like the *Anthemis aurea* DC. At Sange, fr. 9 July 1855. Coll. Carp. 683.

Cazengo.—A small annual herb with the habit of a dwarf *Chrysanthemum* or *Tagetes*, and with small yellow flowers. In poor, sparingly grassy places at the river Luinha; fr. Dec. 1854. (Mixed with other achenes.) Coll. Carp. 669.

Pungo Andongo.—An annual herb, with the habit of *Anthemis*; the early leaves spreading in a stellate manner; the central stems straight, the lateral ones ascending; flowers yellow; achenes without pappus, truncate, ciliolate on the narrow margins, In sandy sunny situations, and in places neglected after cultivation, near the præsidium; plentiful; fl. and fr. Feb. 1857. No. **3958**.

Huilla.—In low-lying pastures flooded during the rainy season, near Humpata; fl. and fr. Nov. 1859 and April 1860. No. **3956**.

TRIBE VI.—HELENIOIDÆ.

53. **JAUMEA** Pers.; Benth. & Hook. f. Gen. Pl. ii. p. 397.

1. **J. angolensis** O. Hoffm. in Bol. Soc. Brot. x. p. 178 (1893) & xiii. p. 32 (1896).

J. compositarum Klatt. in Ann. Naturhist. Hofmus. Wien, vii. p. 103 (1892), non Benth. & Hook. f.

HUILLA.—A perennial herb; rhizome furnished with cylindrical tubercles; stem solitary, erect, 1½ to 3½ ft. high, simple or branched in the upper part, the branches dichotomous or trichotomous; leaves pellucid-punctate, curiously papillose; flowers saffron-coloured. In marshy places among tall bushes along the Lopollo river, in company with *Epilobium hirsutum* L., a *Rumex*, a *Typha*, and species of *Polygonum*; fl. and fr. April 1860. No. **3965**.

54. **WELWITSCHIELLA** O. Hoffm. in Engl. Nat. Pflanzenfam. iv. 5, p. 390 (1894).

1. **W. neriifolia** O. Hoffm., *l.c.*, p. 391, and in Bol. Soc. Brot. xiii. p. 31 (1896).

HUILLA.—A rough, strictly erect, perennial herb, with pellucid-punctate leaves and yellow flowers. In wooded meadows about the lake of Ivantâla; fl. and young fr. end of Feb. 1860. No. **3703**.

55. **TAGETES** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. p. 411.

1. **T. patula** L. Sp. Pl., edit. 1, p. 887 (1753).

GOLUNGO ALTO.—In Sobato de Quilombo; fl. and fr. Jan. 1855. No. **3967**.

PUNGO ANDONGO.—In public streets in the præsidium; frequently wild and occurring almost everywhere by the villages both of the settlers and of the negroes, in all probability introduced long ago by the missionaries; fl. and fr. Jan. 1857. No. **3966**.

TRIBE VII.—ANTHEMIDEÆ.

56. **ATHANASIA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 416.

1. **A. schistostephiodes** Hiern, sp. n.

A rigid perennial plant, 4 to 5 ft. high; stem strictly erect, leafy and unbranched for a considerable length, minutely puberulous or obsoletely felted, terete, branched near the apex; leaves alternate, deeply impari-pinnatifid, obovate in outline, rounded about the apex, narrowed to the shortly quasi-petiolate or subsessile base, subglabrous and minutely punctulate above, softly felted beneath with short curly almost glandular hairs, 1 to 2 in. long by ⅗ to 1⅕ in. broad; the lateral lobes more or less oblong, obtuse, minutely subapiculate, undivided or some of them with an inferior lobule, not denticulate; capitula subhemispherical, ¼ to ⅓ in. in diameter, homogamous, discoid, many-flowered, on rather rigid bracteate pedicels ranging up to 1⅕ in. long, arranged 5 to 7 together in somewhat tomentellous rather dense corymbose cymes ¾ to 1¼ in. in diameter terminating the branches; bracts linear, acute, ¼ to ½ in. long; involucral scales imbricate, subtriseriate, linear-oval, ⅛ to ⅙ in. long, obtuse, puberulous and somewhat thickened along the back, scarious and shortly incised or fringed on the upper margins, somewhat concave; flowers ⅙ to 3/16 in.

long, rather exceeding the involucre, yellow; corolla tubular, pentamerous, $\frac{1}{10}$ in. long, scattered outside with some small sessile glands; the lobes short, rounded, subapiculate at the apex; anthers included, obtuse at the base; style included, with short obtuse branches; achene $\frac{1}{15}$ to $\frac{1}{10}$ in. long, oblong, angular, longitudinally ribbed, glabrous or minutely glandular between the ribs; pappus coroniform, consisting of several short lanceolate or subulate glabrous squamulæ a sixth or a quarter as long as the achene; receptacle somewhat convex, beset with narrowly boat-shaped scales folded round the florets and not much shorter.

Huilla.—In rocky shrubby places near Lopollo, subsequently destroyed by flood; fl. and fr. Jan. 1860. No. **3974**.

This is nearly related to *A. punctata* Harv.

57. **CHRYSANTHEMUM** Tournef., L., Benth. & Hook. f. Gen. Pl. ii. p. 424.

1. **C. pinnatifidum** L. f. Suppl. Pl. p. 377 (1781).

Argyranthemum pinnatifidum Lowe, Man. Fl. Madeira i. p. 460 (1868); non Webb in Webb & Berthelot, Phytogr. Canar. t. 95 (1836–1840).

Island of Madeira.—Root white. In rocky bushy places at Camara dos Lobos; fl. and fr. Aug. 1853. No. **3948**.

58. **COTULA** Vaill., L.; Benth. & Hook. f. Gen. Pl. ii. p. 428.

1. **C. anthemoides** L. Sp. Pl., edit. 1, p. 891 (1753); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 397; O. Hoffm. in Bol. Soc. Brot. xiii. p. 32 (1896).

Mossamedes.—An annual, prostrate, marsh herb, pleasant with a bitter aromatic scent, closely resembling the officinal Chamomilla romana (*Anthemis fuscata* Brot.); pubescence arachnoid; capitula globose, yellow, rather short; achenes sessile, those of the ray-florets scarcely winged. In sandy-muddy places along the banks of the river Bero; fl. and fr. end of July 1859. No. **3949**. In damp sandy places by the river Bero near Cavalheiros, rather rare; fl. and fr. beginning of Aug. 1859. No. **3951**.

Huilla.—In sandy-muddy places flooded in the rainy season, near Lopollo; fl. and fr. Nov. 1859. No. **3950**.

59. **ARTEMISIA** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. 435.

1. **A. afra** Jacq. ex Willd. Sp. Pl. iii. p. 1820 (1800), & Hort. Schoenbr. iv. p. 34, t. 467 (1804); Harv. & Sond. Fl. Cap. iii. p. 170 (1865); Ficalho, Pl. Uteis, p. 209 (1884).

Bumbo.—On rocky declivities above Bumbo, where several plants of the Huilla table-land and those of the mountainous woodland region, and even some of the littoral region, grow together promiscuously; not yet in fl., Oct. 1859. No. **3955**.

Huilla.—3 to 4 ft. high. At Mumpulla; fl. and fr. Oct. 1859. No. **3954**. A remarkably aromatic and very bitter herb, shrubby at the base; stems numerous, erect, 2 to 5 ft. high; leaves green, clothed beneath with a snow-white felt. In bushy places and in pastures throughout the district, very plentiful; at Humpata, fl. and fr. April 1860. No. **3953**.

This is apparently the "Losna de Humpata" (Humpata wormwood) mentioned by Welwitsch in Synopse Explic. p. 26, n. 57, as containing

in a remarkable degree the bitter and aromatic principles of the genus; an infusion of it may be employed with benefit as a tonic and stomachic treatment during convalescence after marsh fevers; also the powder as an anthelmintic remedy, especially for children, as observed by Welwitsch with good results during his stay in Huilla.

Tribe VIII.—Senecionideæ.

60. **ENGLERIA** O. Hoffm. in Engl. Bot. Jahrb. x. p. 273, t. ixa. (1888). *Adenogonum* Welw. ex Oliv. in Hook. Ic. Pl. xxiii. t. 2205 (April 1892).

1. **E. decumbens.**

E. africana O. Hoffm., *l.c.*, var. *radiata* Oliv., *l.c.* *Adenogonum decumbens* Welw. ex Oliv., *l.c.*; Hiern in Journ. Bot. xxxvi. p. 290, t. 389 (Aug. 1898).

Mossamedes.—A remarkably ornamental herb, apparently annual, with the habit of a *Cineraria* though with different style-branches; stems much branched from the base, decumbent, at length as well as the branchlets ascending; leaves opposite or rarely the upper ones alternate, glossy-green in the living state; ray-florets uniseriate, ligulate, tridentate at the apex, female, fertile, as well as the disk-florets very bright yellow shining subscarious and persistent; corolla of the disk-florets pilosulous, with reflected lobes; anthers ecaudate; filaments enlarged a little below the apex with a waxy orange-coloured gland; style-branches elongated, subclavate-thickened, densely puberulous; achene elongate-obovoid, somewhat compressed, more or less covered with rather rigid hairs, with the marginal ribs rather acute and those on the faces obtuse, and with oily glands within the margin of the lateral ribs; pappus biseriate, the outer row short and often but little developed, the setæ of the inner row scabrid, unequal in length, rather rigid, straight, and persistent.

Mossamedes.—At the gneiss rocks by the upper banks of the river Bero, not plentiful; fl. and fr. July 1859. No. **3999.**

I follow Oliver in referring this plant to *Engleria*, and the generic character must be modified accordingly; but I cannot regard it as the same species as the Hereroland *E. africana*, or even a variety of it. It differs from the latter in the following characters: the capitula are heterogamous and radiate, the achenes are not narrowly winged, the leaves are ovate-cordiform not attenuate at the base into the petiole, and the plant does not appear to be perennial.

61. **GONGROTHAMNUS** Steetz; Benth. & Hook. f. Gen. Pl. ii. p. 437.

1. **G. conyzoides** Hiern, sp. n.

A shrub, in habit almost like the shrubby *Conyzeæ*; stems crowded, slender, straight, reddish, beset with abundant lenticels; branches patent, tomentose; felt pallid; leaves alternate, ovate or elliptical, pointed and often acuminate at the apex, contracted often abruptly so at the base, membranous-herbaceous, yellowish-green above, rather paler beneath, clothed with short curly pale hairs on both faces denser and felted beneath, toothed or repand or nearly entire, triplinerved and penniveined, $1\frac{1}{4}$ to 4 in. long by $\frac{3}{4}$ to $2\frac{3}{4}$ in. broad, those of the young branchlets larger and

arranged almost in a peltate manner; petioles $\frac{1}{8}$ to $\frac{3}{8}$ in. long, felted; capitula about 22-flowered, obconical, $\frac{3}{8}$ to $\frac{1}{2}$ in. long, woolly below, pallid, numerous, on short unequal bracteolate pedicels arranged in hemispherical terminal panicles 2 to 3 in. in diameter or in ampler leafy compound panicles; scales of the involucre pluriseriate, pointed, uninerved, the outermost very small woolly outside and subdeltoid, the inner successively larger more oblong and less woolly, the innermost about $\frac{1}{4}$ in. long, lanceolate-oblong, acute and ciliolate about the apex; corollas shortly 5-cleft, the lobes rather obtuse, about one-third as long as the tube, furnished at the apex with a large thick gland; anther-bases appendaged; basal appendages linear, truncate; style at the base seated on a depressed quasi-annular bulb; the branches somewhat flattened on the inner face; young achenes densely hairy with stiff hairs directed upwards and arranged in about 10 longitudinal rows; pappus setaceous, sordid-tawny, subuniseriate, a few outer setæ short, the inner about $\frac{1}{4}$ in. long, rather hispid and rigid, slightly dilated and ciliolate-fimbriate at the apex; receptacle pitted, the pits with irregularly raised margins.

Huilla.—In sunny rocky bushy places between Mumpulla and Nene; not yet in open fl. Oct.; sparingly in fl. Dec. 1859. At 5000 ft. altitude. No. **3271.**

This is nearly related to *G. divaricatus* Steetz, but is not glabrate.

2. **G. angolensis** Hiern, sp. n.

An undershrub, 2 to 4 ft. high, under favourable circumstances becoming woody, sparingly branched; branches spreading, rambling, terete, purplish, glabrate, sulcate-striate, rather slender, nearly straight; branchlets puberulous or obsoletely woolly, erect-patent; leaves elliptical, alternate, more or less narrowed at both ends especially towards the base, subapiculate at the apex, membranous, glabrate or puberulous, yellowish-green (in the dry state), entire crenulate or obscurely toothed, 1 to 2 in. long by $\frac{1}{4}$ to $\frac{2}{3}$ in. broad, minutely punctate, triplinerved and penniveined; petioles $\frac{1}{8}$ to $\frac{1}{4}$ in. long or less; capitula numerous, $\frac{1}{3}$ in. long, campanulate-oblong, 4-flowered, on short pubescent bracteolate pedicels arranged in rather dense compound more or less leafy corymbose or hemispherical terminal cymes of 2 to 8 in. in diameter; bracteoles ovate or lanceolate pubescent, small; involucral scales pluriseriate, firmly scarious, the outer short broadly ovate apiculate and outside pubescent, the inner gradually longer more lanceolate acute and nearly glabrous ranging up to $\frac{1}{6}$ in. long; flowers $\frac{1}{4}$ in. long; corollas $\frac{1}{5}$ in. long, yellow, narrowly tubular, not much dilated upwards, shortly 5-lobed; the lobes lanceolate, curving outwards; anthers sagittate at the base, each with a lanceolate appendage at the apex; style exserted, arising from a bulbous sub-annular disk (or nectary) at the base, puberulous on the upper part; the branches also puberulous, spreading-recurved, subobtuse; achenes 4, irregularly obconical-obovoid, unequally 10-ribbed, $\frac{1}{10}$ in. long, shortly pubescent, with a small callus at the base; pappus sub-

uniseriate, sordid-yellowish, with a few outer short setæ and numerous inner rigid hispidulous-scabrid setæ $\frac{1}{5}$ in. long; receptacle small, convex, furnished with small short unequal tumid scales.

Mossamedes.—On rocky declivities between Pomangala and Quitibe, also at Caldari do Inferno; fl. and fr. June 1860. No. **3270**.

Huilla.—A small shrub, abundant but nearly everywhere without its leaves; neither flowers nor leaves seen except on one plant. By thickets between Mumpulla and Nene, not uncommon. Oct. 1859. No. **3266**.

Bumbo.—A little shrub, at the time of gathering leafless and inelegant. By thickets near Bumbo; fr. Oct. 1859. Apparently this species. No. **3264**.

With this genus, which has been reduced by O. Hoffmann in Engl. & Prantl, Nat. Pflanzenfam. iv. 5 p. 126 (1889) to the section Decaneurum of *Vernonia*, should be carefully compared *Autunesia* O. Hoffm. in Bol. Soc. Brot. x., p. 178 (1893); I have not seen an authentic specimen of the latter.

The following two Nos. perhaps belong to different species of *Gongrothamnus* :—

Huilla.—A shrub, almost leafless at the time of gathering, with only one branch seen in fruit; branchlet terete, pallid, felted with short thick whitish closely set hairs; leaves alternate, the young ones crowded on the lateral shoots, oval, obtuse at both ends but apiculate at the apex, denticulate-repand, shortly petiolate, subcoriaceous, clothed on both faces with pallid closely-set short almost scaly hairs, about 1 in. long by $\frac{1}{2}$ in. broad; lateral veins 4 or 5 on each side of the midrib, starting at a wide angle; infructescence on short lateral shoots, dense, hemispherical, 1 to $1\frac{1}{2}$ in. in diameter; capitula apparently homogamous, about 12-flowered, on unequal tomentellous pedicels ranging up to $\frac{3}{4}$ in. long; involucral scales subtriseriate, oblong, obtuse, uninerved, flat or nearly so, somewhat hairy on the back, the innermost ones $\frac{1}{6}$ in. long, the outer ones successively shorter; receptacle small, at length somewhat convex, puberulous, not paleaceous; achenes narrowly obovoid-oblong, brownish, clothed with pale hairs, longitudinally 8- to 10-ribbed, $\frac{1}{6}$ in. long, surmounted with a pallid setose pappus $\frac{1}{4}$ in. long; the setæ sub-biseriate, densely setulose, the outer few and short. Between Mumpulla and Nene. Oct. 1859. No. **4001**.

Huilla.—No notes. In fr. No. **3699**.

62. **CRASSOCEPHALUM** Moench, Meth. Pl. p. 516 (1794). *Gynura* Cass. in Dict. Sc. Nat. xxxiv. p. 391 (1825); Benth. & Hook. f. Gen. Pl. ii. p. 445.

1. **C. cernuum** Moench, *l.c.*

Senecio rubens Jacq. Hort. Vindob. iii. p. 50, t. 98 (1777). *S. cernuus* L. f. Suppl. Pl. p. 370 (1781). *Gynura cernua* Benth. in Hook. Niger Fl. p. 437 (1849); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 402.

Var. *a.* **rubens**. Flowers violet-rosy or rose-coloured.

Golungo Alto.—An annual, bright-green herb, 2 to 3 ft. high; the peduncles of the capitula nodding at the apex. In damp herbaceous places by rivulets, mixed with the blue-flowered variety;

cataract of the river Cuango ; fl. and fr. March 1855. No. **3584**. An erect herb, 2 to 3½ ft. high, with nodding capitula. In damp reed-beds at the river Cuango, plentiful and in company with the blue-headed variety ; fl. and fr. Feb. 1856. No. **3585**. Varzea Canaulo, fl. and fr. June 1856. No. **3586**. Varzea de Cuango ; fl. June 1856. No. **3587**.

Huilla.—In the wooded meadows of the Monino ; fl. and fr. Jan. 1860. No. **3591**.

Var. *β.* **cæruleum.** Flowers blue. Cf. *G. cærulea* O. Hoffm. in Bull. Herb. Boiss. i. p. 86 (1893).

Golungo Alto.—Among crops of *Arachis hypogæa*, near Sange ; fl. and fr. No. **3588**. Between Trombeta and Cabonda ; fl. and fr. Sept. 1854. No. **3589**. Capitula on very long peduncles, nodding. Varzea de Cuango, plentiful ; fl. and fr. Feb. 1856. Coll. Carp. 667.

Huilla.—In plantations of maize on damp ground about Lopollo, but scarcer than the other variety ; fl. and fr. Jan. and Feb. 1860. No. **3593**.

2. **C. diversifolium.**

Senecio diversifolius A. Rich. Fl. Abyss. i. p. 437 (1847) ; non Wall. *Gynura polycephala* Benth. in Hook. Niger Fl. p. 437 (1849). *G. crepidioides* Benth., *l.c.*, p. 438 ; O. & H., *l.c.*, p. 403. *S. crepidoides* Aschers. in Schweinf. Beitr. Fl. Æthiop. p. 155 (1867).

Var. *α.* **polycephalum.** Leaves mostly pinnatifid ; flowers lilac ; achenes setulose between the ribs.

Huilla.—In neglected fields and at the damp borders of level spaces especially where sandy, about Lopollo, etc. ; fl. and fr. from Dec. 1859 to March 1860. No. **3592**.

Var. *β.* **subincisum** (Aschers., *l.c.*, p. 156). Lower and middle leaves undivided, unequally dentate, the upper ones incise-dentate at the base or sub-pinnatifid ; flowers lilac, verging on rosy ; achenes somewhat setulose between the ribs.

Huilla.—In fields among crops ; about Lopollo, plentiful ; fl. and fr. Jan. 1860. No. **3590**.

Var. *γ.* **sonchiforme.** An annual, erect, branched herb, with the habit of a *Sonchus* ; leaves mostly sub-lyrate, sinuate-dentate or repand, the teeth obtuse mucronulate ; flowers violet-purple, erect ; achenes setulose.

Mossamedes.—In swampy places and neglected patches after cultivation near Hortas de Mossamedes ; fl. and fr. beginning of July 1859. No. **3581**.

Var. *δ.* **cyaneum.** An annual herb, 3 to 4 ft. high ; branches elongated, slender ; leaves mostly lyrate-pinnatifid, auriculate at the base ; flowers bright blue ; achenes setulose.

Mossamedes.—In moist sandy thickets at the banks of the river Bero, rather rare ; fl. and fr. beginning of August 1859. No. **3582**.

Var. *ε.* **Welwitschii.** Leaves mostly undivided, unequally dentate, exauriculate ; flowers bright-blue ; achenes nearly glabrous.

Huilla.—In plantations of maize and at their borders, near Eme ; fl. and fr. Feb. 1860. No. **3594**.

Var. ζ. **crepidoides**. A perennial or annual, bright green herb, 2 to 4 ft. high, with somewhat nodding saffron- or orange-coloured flowers which become rose-coloured in course of drying.

Golungo Alto.—Annual. In damp palm-groves near N-delle; fl. and fr. Dec. 1855. No. **3688**. Perennial. By moist thickets in Sobato de Bumba, not plentiful; fl. and fr. end of Dec. 1855. No. **3687**.

3. **C. miniatum**.

Gynura miniata Welw. Apont. p. 586. n. 29; O. & H., *l.c.*

Ambaca.—Root thick, tuberous, perennial; leaves (only the lower ones developed at the time) strongly musk-scented. At Puri-Cacarambola; without either fl. or fr. Oct. 1856. No. **3596**.

Pungo Andongo.—Flowers of a deep orange-colour. By the waterfall at Calundo near Caghuy; fl. and fr. 14 Dec. 1856. No. **3595**.

4. **C. scandens**.

Gynura scandens O. Hoffm. in Engl. Pfl. Ost Afr., C, p. 416 (1895).

Golungo Alto.—A climbing suffruticose herb, with flowers of a pallid orange-colour; fl. June 1855. No. **3697**.

Our specimens differ slightly from the type of the species by their rather smaller leaves with a more deltoid apiculate apex and with the base somewhat excavated, and by larger capitula containing about 26 florets.

63. **EMILIA** Cass.; Benth. & Hook. f. Gen. Pl. ii. p. 445.

1. **E. purpurea** Cass. in Dict. Sc. Nat. xxxiv. p. 393 (1825).

Cacalia sonchifolia L. Sp. Pl., edit. 1, p. 835 (1753), *E. sonchifolia* DC. Prodr. vi. p. 302 (1837); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 405.

Sierra Leone.—In mountainous situations between Freetown and the mountain ridge, among scattered herbs; fl. and fr. Sept. 1853. No. **3579**.

Prince's Island.—An annual herb, with the habit of a *Sonchus* and with violet-coloured flowers. In damp sunny forests; fl. Sept. 1853. No. **3583**.

Huilla.—Inflorescence lax, with slender pedicels and yellow flowers. In Morro de Lopollo; fl. Feb. 1863. Perhaps a variety of this species. No. **3580**.

This is difficult to distinguish from the next species.

2. **E. flammea** Cass. in Dict. Sc. Nat. xiv. p. 406 (1819).

Cacalia sagittata Vahl, Symb. Bot. iii. p. 91 (1794). *E. sagittata* DC., *l.c.*; O. & H., *l.c.*, p. 405.

Golungo Alto.—In elevated places at the outskirts of the forest above the Delamboa; fl. and fr. April 1856. No. **3575**. About Sange; fl. and fr. No. **3576**. A herb, 2 to 3½ ft. high, less glaucous and with much longer capitula than in some forms; stem weak, suberect, sparingly branched; flowers with a deep saffron-orange colour. In the more elevated mountainous parts of Sobato Quilombo-Quiacatubia in dense thickets about 2000 ft. altitude; also among the mountains of Sobato de Bumba Andala, but rather rare; fl. and fr. Feb and Oct. 1855. No. **3577**. In the sandy forests of N-delle, not yet in open flower, Jan. 1855. Apparently this species. No. **3928**.

Huilla.—Flowers orange-scarlet. In the wooded pastures of the Monino, among tall herbs, sporadic; fl. April 1860. No. **3578**.

3. **E. albocostata** Hiern, sp. n.

A sparingly pubescent, suffruticose, much-branched herb; branches subterete, striate, alternate, leafy; stem-leaves alternate, oval oblong ovate or obovate, sessile, auriculate-clasping at the base, membranous, subglabrous or puberulous, paucidentate in repand, mucronulate at the apex, 2 to $2\frac{1}{2}$ in. long by $\frac{1}{2}$ to $1\frac{1}{4}$ in. broad; capitula homogamous, discoid, campanulate, somewhat turbinate at the base; $\frac{5}{8}$ to $\frac{3}{4}$ in. long, ecalyculate, glabrous except the base, erect, many-flowered, solitary; peduncles glabrous, naked or nearly so, erect or ascending, 7 to 10 in. long, terminating the branches; involucral scales 8, uniseriate, erect in flower, recurved after the fruit, linear-oblong, deltoid and minutely ciliolate at the apex, very narrowly scarious on the lateral margins, parallel-nerved, $\frac{1}{3}$ in. long, shorter than the florets; flowers yellow; florets hermaphrodite, tubular, nearly $\frac{1}{2}$ in. long; corolla membranous, shortly 5-lobed; the lobes lanceolate, thickened towards the apex, anthers shortly exserted and narrowly appendaged at the apex, obtuse and not appendaged at the base; style-branches short, rather thick, somewhat compressed, just exserted, each terminating in a very short deltoid-ovoid appendage; receptacle $\frac{1}{8}$ to $\frac{1}{4}$ in. in diameter, at length convex; achenes $\frac{1}{5}$ in. long, at length nearly black and glabrous except the 5 longitudinal ribs which are clothed with short dense gland-like white hairs; pappus whitish or at length white, copious, persistent, about $\frac{3}{10}$ in. long.

Mossamedes.—In hilly sandy places amidst Euphorbias; fl. and fr. July 1859. No. **3573**.

This is nearly related to *Senecio othonnæflorus* DC.

64. **NOTONIA** DC.; Benth. & Hook. f. Gen. Pl. ii. p. 446.

1. **N. Welwitschii.**

Senecio (Notonia) *Welwitschii* O. Hoffm. in Bol. Soc. Brot. xiii. p. 33. *Podachænium* Welw. ms. ex O. Hoffm., *l.c.*, and in Herb.

A succulent perennial suffrutescent herb, with the habit of a *Kleinia* or *Cacalia*, and, as to its capitula, with a distant resemblance to a *Dianthus*, the whole plant except the flowers pulverulent-glaucous, 2 ft. high; rhizome thick, oblique, fleshy, tuberous, the tubers clustered several together; stem straight or ascending, cylindrical, fleshy, brittle, leafy; the lower leaves large, obovate-spathulate fleshy-succulent, brittle, coarsely and distantly dentate, rather obtuse, on alate-canaliculate obtusely keeled semi-amplexicaul petioles; the upper leaves narrowly lanceolate, acuminate, fleshy, brittle; capitula homogamous, campanulate, smooth, ecalyculate; involucral scales 8 to 12, erect, convex at the back; peduncles fistular; corolla tubular-hypocrateriform, equal, the limb 5-cleft, patent, bright-scarlet, clothed at the base with a long white pubescence; anthers surmounted at the apex with lanceolate empty appendages, included; stigmas compressed-spathulate, purple-barbellate outside, not or scarcely ciliate at the

base, terminating in a short compressed pilosulous cone; achene more or less cylindrical, slender, glabrous, sulcate-striate, truncate at the apex, subtruncate and slightly stipitate at the base; pappus 2- to 3-seriate, in very closely approximate rows, setose, the setæ numerous, setulose-scabrid; receptacle flat, alveolate, the alveolæ minutely and unequally dentate-fimbriate and each with the erect stipes of the achene in its centre.

HUILLA.—A very beautiful plant. In rocky elevated parts of Morro de Lopollo, very sparingly fl. and fr. Jan. 1860. In dry thickets about Lopollo; fl. and fr. April 1860. No. **3572**. Flowers large, cinnabar-red. Lopollo, fl. and fr. May 1860. COLL. CARP. 670.

O. Hoffmann, *l.c.*, quotes 3582 instead of 3572.

65. **SENECIO** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. p. 446.

1. **S. coronopifolius** Desf. Fl. Atl. ii. p. 273 (1798); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 412.

MOSSAMEDES.—A small annual herb, branched from the base; branches ascending, reddish; leaves rather fleshy, somewhat viscid; flowers yellow. At the sandy banks of the river Giraûl, then almost dry, at an elevation of scarcely 10 ft.; fl. July 1859. Only one specimen. No. **3669**.

2. **S. picridifolius** DC. Prodr. vi. p. 386 (1837); O. & H., *l.c.*, p. 413.

GOLUNGO ALTO.—A glaucescent, ascending herb, 2 to 3½ ft. high, with the habit of an *Emilia* or *Crassocephalum*; branches elongated, slender, quasi-scandent; peduncles rosy; flowers orange-yellow or of a deep lemon-colour. In the damp thickets of Sobato de Bumba at the river Casaballa, rather rare; fl. and fr. beginning of May 1856. No. **3696**.

HUILLA.—Flowers orange-yellow. In the wooded thickets of Morro de Lopollo; fl. and fr. Feb. 1860. No. **3694**. Flowers yellow. In swampy places at the rivulet Catumba; fl. and fr. March 1860. No. **3695**.

3. **S. erubescens** Ait. Hort. Kew. edit. 1, iii. p. 190 (1789); Harv. in Harv. & Sond. Fl. Cap. iii. p. 363 (1865).

HUILLA.—Flowers purplish. In moist pastures from Lopollo in the direction of Catumba, rather rare; fl. and fr. Dec. 1859. Afterwards searched for in vain. No. **3668**.

4. **S. versicolor** Hiern, sp. n.

A perennial glandular-puberulous herb; rootstock more or less præmorse; stem decumbent, ascending, sometimes rooting with adventitious fibres or branching near the base, 1 to 2 ft. high, leafy below, branched in the upper half and there forming a cymose somewhat leafy corymbose or obovoid inflorescence; leaves alternate, narrowly oblong sublinear or oblanceolate, obtuse at the apex, somewhat narrowed to a sessile or subsessile auriculate clasping base, more or less coarsely or distantly toothed or subpinnatifid, thinly herbaceous, 1½ to 4 in. long by ⅙ to ⅓ in. broad; capitula campanulate, homogamous, discoid, ⅓ to ⅔ in. long, usually calyculate with very few small narrow scales similar to the uppermost bracts on the pedicels, on unequal pedicels arranged in a much-branched rather lax terminal cyme 2 to 6 in. in

diameter; pedicels slender, dilated at the apex, ranging up to $1\frac{1}{4}$ in. long; branches of the inflorescence bracteate; bracts lanceolate or subulate, entire, $\frac{1}{16}$ to $\frac{1}{2}$ in. long; involucral scales uniseriate, equal, about 20, $\frac{1}{5}$ in. long, sublinear, narrowed at the apex to a reddish scarious-tipped point, scarious on the imbricating lateral margins, erect in flower, reflexed after the fall of the fruit; flowers lilac or of a pale whitish-violet colour, quickly turning yellowish, numerous, hermaphrodite, tubular, about $\frac{3}{10}$ in. long; corolla membranous, $\frac{1}{6}$ in. long, very narrow about the middle, slightly dilated near the base, funnel-shaped in the upper half, shortly 5-lobed, the lobes triangular-ovate, uninerved, obtuse; anthers clear bright blue, half exserted, shortly appendaged at the apex, subobtuse and exappendiculate at the base but with the filaments abruptly thickened near their apices; style-branches narrow, puberulous-stigmatose, exappendiculate, truncate-dilated at the apex, equalling the corolla; achenes subterete, dusky when ripe, tapering a little from the middle towards each end, 10-ribbed, setulose with short thick whitish hairs between the ribs, $\frac{1}{12}$ in. long, with a narrow whitish cartilaginous ring round the apex from which arises the copious white silky subuniseriate setose pappus; the setæ very slender, very delicately scabrid (as seen under a lens), $\frac{1}{5}$ in. long; receptacle flat, about $\frac{1}{10}$ in. in diameter, naked.

Huilla.—In marshy places; fl. and fr. Dec. 1859. No. **3677**. In damp meadows (varzeas) at the river Cacolovar, on the right-hand side of the road leading from Ivantâla to Quilengues; fl. and fr. Feb. 1860. No. **3678**.

This somewhat resembles *S. purpureus* L., but the leaves are less deeply divided and the achenes setulose; it is also rather like *S. crispus* Thunb.

5. **S. latifolius** DC. Prodr. vi. p. 387 (1837); Harv., *l.c.*, p. 377.

S. bupleuroides DC., *l.c.*; O. & H., *l.c.*, p. 414.

Huilla.—An erect, glaucescent, apparently perennial herb, with yellow flowers. In the drier bushy pastures near Ferião da Sola, not plentiful; fl. and fr. Dec. 1859. No. **3673**. At Lopollo; fl. Dec. 1859. No. **3674**.

6. **S. lasiorhizus** DC., *l.c.*; O. & H., *l.c.*, p. 415.

Cineraria coronata Thunb. Prodr. Pl. Cap. pars posterior, p. 154 (1800). *S. coronatus* Harv., *l.c.*, p. 369.

Huilla.—A herb with the form of a *Cineraria*; stems several, erect; ligule of the ray-florets bright golden-yellow, disk-florets paler. In the moist meadows of Mumpulla, in company with *Scabiosa Columbaria* L. (Welw. Herb. No. 520); fl. and fr. Oct. 1859. No. **3625**. Flowers yellow. In the drier bushy pastures about Lopollo towards the east, in company with Thymelæaceæ and Santalaceæ; fl. and fr. Nov. and Dec. 1859. A rather hairy form of the species. No. **3686**. A perennial herb, 1 to $1\frac{1}{2}$ ft. high; stem firm, erect; flowers corymbose, yellow. Lopollo; fr. Dec. 1859 and Jan. 1860. Apparently this species, Coll. Carp. 665.

7. **S. pentecostus** Hiern, sp. n.

An erect, pale green, conspicuous herb, 3 to 5 ft. high; root-

stock thick, abrupt at the base, there giving off thick descending fibres, apparently perennial; stem costate-sulcate, glabrate, branched above at the inflorescence; branches angular, leafy, more or less clothed (as are also some of the leaves and inflorescence) with white papery-floccose deciduous or obsolete patches; radical or lower leaves narrowly elliptic-oblong, narrowed at both ends especially towards the petiolate base, glabrescent, herbaceous, ranging up to more than 2 ft. long (inclusive of the petiole) by 2 in. broad, crenulate-denticulate on the subcartilaginous margin uninerved; the petiole clasping; stem-leaves similar but smaller and the upper ones sessile, alternate; capitula heterogamous, radiate, calyculate, campanulate, numerous, about 50-flowered, $\frac{3}{8}$ to $\frac{1}{2}$ in. long, on bracteate pedicels ranging up to $1\frac{1}{2}$ in. long, arranged in rather dense corymbose terminal cymes of about 6 in. in diameter; bracts narrow; calyculus consisting of several smaller bracts similar to those of the inflorescence; flowers golden-yellow; involucral scales about 17, subglabrescent, linear-oblong, about $\frac{1}{3}$ to $\frac{1}{4}$ in. long, lance-shaped towards the ciliolate apex, scarious on the imbricate margins; female florets about 8, ligulate, marginal, uniseriate, fertile, about $\frac{1}{3}$ in. long, with a short bifid style, a glabrous ribbed and subcompressed ovary, and setose whitish barbellate rather copious subuniseriate pappus; the ligule oval, very shortly 3-lobulate at the apex; hermaphrodite florets discoid, pluriseriate, about 42, tubular, $\frac{1}{4}$ in. long; the corolla shortly 5-lobed, glabrous; anthers about equalling the corolla, at length shortly exserted, obtusely appendaged at the apex, obtuse and not appendaged at the base; style-branches short, somewhat flattened, very obtuse and stigmatose at the apex, equalling the anthers; ovary glabrous, subcompressed, ribbed; setæ of the pappus pauciseriate, whitish, minutely setulose, rather copious, $\frac{1}{6}$ in. long, persistent; receptacle areolate, the areolæ sometimes minutely paleaceous-fringed.

Huilla.—In marshy places along the banks of the Lopollo stream, plentiful; fl. beginning of May 1860. No. 3681.

This is nearly related to *S. albanensis* DC.

8. **S. lygodes** Hiern, sp. n.

An erect glabrate robust herb, 3 ft. high or more; stem angular or narrowly winged by the decurrence of the leaves, unbranched up to the inflorescence, leafy, pale, somewhat yellowish; leaves alternate, narrowly elliptical-linear or the upper ones sublinear, attenuate at each end, sessile, decurrent, suberect, uninerved, ranging up to more than a foot long by about 1 in. broad, thinly herbaceous, pale yellowish-green; the margins narrowly cartilaginous and revolute, minutely crenulate; capitula campanulate, calyculate or at least bracteolate at the base, radiate, heterogamous, numerous, $\frac{3}{8}$ to $\frac{2}{3}$ in. long, erect, on unequal rather slender bracteolate pedicels ranging up to $1\frac{3}{4}$ in. long arranged in a corymbose terminal not very dense cyme of 4 to 6 in. in diameter; bracteoles narrow, the uppermost ones the

smallest, scarious and often lacerate-ciliolate at the tip, extending to the base of the capitula; flowers yellow; involucral scales about 15, narrowly oblong or sublinear, united at the base and some of them much higher up, pale yellowish-green, with scarious margins, darker near the scarious lacerate-ciliolate tips, subuniseriate, about $\frac{1}{4}$ in. long, imbricate; female florets few, exterior, fertile; the ligula $\frac{1}{5}$ in. long, very shortly lobed at the apex; the style shortly cleft; hermaphrodite florets numerous, discoid, $\frac{5}{16}$ in. long, fertile; the corolla shortly 5-lobed; anthers at length exserted, shortly appendaged at the apex, their bases caudate; the style-branches at length exserted, narrow, truncate, exappendiculate; achenes (young) subterete, glabrous; the pappus copious, white, setose, $\frac{1}{5}$ in. long; the setæ pauciseriate, minutely scabrid.

Huilla.—In swampy willow-beds at the banks of the river Quipumpunbime, Humpata; fl. Jan. and March 1860. No. **3676**.

This is nearly related to *S. longipedunculatus* Volkens, from the Transvaal Republic, collected by Dr. F. Wilms, nn. 800 and 800*a*.

9. **S. strictifolius** Hiern, sp. n.

An annual, erect herb, 2 to 3 ft. high, nearly glabrous; stem more or less angular, sulcate-costate, virgate, simple and purplish below, corymbosely branched and paler towards the apex at the inflorescence, leafy; leaves alternate, suberect, narrowly elliptic-oblong, rather obtuse at the mucronulate apex, attenuate towards the sessile or subsessile somewhat clasping base, scarcely decurrent, pale, yellowish-green on both faces, rigidly herbaceous, slightly puberulous with a deciduous or nearly obsolete down, cartilaginous-serrulate and narrowly revolute on the margin, 2 to 3 in. long by $\frac{1}{5}$ to $\frac{1}{3}$ in. broad; capitula heterogamous, radiate, campanulate, calyculate, $\frac{1}{4}$ in. long, numerous, glabrous, on slender bracteate pedicels ranging up to $\frac{3}{4}$ in. long, arranged in flat-topped terminal rather lax cymes of 3 to 4 in. in diameter; flowers yellow; calyculous consisting of a few narrow bracts like the uppermost bracts on the pedicels; involucral scales uniseriate, about 13, linear-oval, about $\frac{1}{6}$ in. long, dark-reddish at each end, scarious on the margin; female florets marginal, uniseriate, radiate, about 12, fertile; the ligule oblong, minutely lobed at the apex, $\frac{1}{8}$ in. long; disk-florets about 29, hermaphrodite tubular, $\frac{1}{5}$ in. long; the corolla thin, short 5-lobed; the anthers partly exserted, shortly appendaged at the apex, obtuse and exappendiculate at the base; style-branches exserted, rather short, slender, obtuse, exappendiculate; ovary glabrous, smooth, with a thin whitish ring round the apex from which arises the deciduous rigid whitish rather copious erect setose pappus; the setæ minutely barbellate, about $\frac{1}{6}$ in. long; receptacle narrow, somewhat papillose.

Huilla.—In marshy places along streams near Lopollo and at the lake of Ivantâla; fl. 14 March 1860. No. **3675**.

Nearly related to *S. Serra* Sond., non Schweinf.; it differs by more numerous florets and smaller foliage, etc.

10. **S. Brittenianus** Hiern, sp. n.

A herb, 3½ ft. high or more; stems suffruticose below, floccose or obsoletely white-cottony above; branches striate, lax; leaves narrowly ellipsoidal or lanceolate-oblong, narrowed towards both ends, acuminate or apiculate at the apex, often attenuate to the sessile and somewhat auriculate base, herbaceous, toothed, more or less cottony, especially beneath, with white often deciduous silky hairs, 2 to 3 in. long by ¼ to ⅔ in. broad; capitula campanulate or at length hemispherical, homogamous, discoid, many-flowered, ¼ in. long, on unequal bracteolate rather slender pedicels ranging up to about ½ in. long, arranged in dense terminal corymbose somewhat cottony cymes 3 to 4 in. in diameter; involucral bracts about 20, sublinear, acute, about ⅓ in. long, puberulous on the back, with scarious lateral margins and fuscous tips; those of the calyculus several, much smaller, similar; flowers yellow; corolla about ⅓ in. long, tubular, rather abruptly dilated near the middle upwards, the limb short, 5-cleft; anthers appendaged and exserted at the apex, exappendiculate at the base; style-branches circinate, truncate at the apex, just exserted; receptacle areolate, convex in fruit, rather narrow, naked; achenes about ⅛ in. long, subcylindrical, more or less ribbed and setulose; pappus copious, white, setose, longer than the achene; the setæ barbellate, very slender.

Huilla.—At the borders of fields near Mumpulla; fl. and fr. Oct. 1859. No. **3679**. On a clay soil near the Lopollo stream; fl. Feb. 1860. No. **3680**.

This species has very much the general appearance of *S. myriocephalus*, but differs by its discoid flower-heads, more numerous involucral scales, etc.

11. **S. lopollensis** Hiern, sp. n.

A somewhat hoary herb, 4 to 8 in. high; root wiry, branched, creeping and descending, apparently perennial; stems numerous, slender, procumbent or ascending, short or low, pubescent-tomentose or puberulous with whitish hairs, leafy; leaves alternate, mostly crowded, elliptical or obovate, rounded or obtusely pointed at the apex, narrowed towards the sessile or shortly petiolate exauriculate base, firmly herbaceous, grey at least beneath, clothed on both faces more or less with whitish crisp or curly hairs, entire or repand, with somewhat thickened cartilaginous margins, ½ to ¾ in. long by ⅕ to ⅔ in. broad; peduncles terminal, slender, erect, scapelike, glabrescent above, puberulous below, one-headed, 3½ to 7 in. long, without bracts or occasionally with a small one about the middle; capitula homogamous, discoid, subcampanulate, rather dilated at the apex, ecalyculate, erect, ⅓ to ⅔ in. long, ⅛ to ⅕ in. thick at the apex of the involucre; involucral scales uniseriate, about 8, linear-oblong, pointed at the apex, erect, slightly puberulous on the back near the apex, obscured marked with parallel nerves, scarious on the margins; flowers purple, numerous, rather exceeding the involucre, appa-

rently all fertile; corolla dilated into a small hemisphere at the base, slightly and gradually widened upwards, shortly 5-cleft at the apex, the lobes lanceolate; anthers included in the corolla, rather exceeding its tube, acute and appendaged at the apex, obtuse and not appendaged at the base; style-branches about equalling the anthers, short, truncate, stigmatose at the apex; achenes (young) oblong, unequally ribbed, glabrous, $\frac{1}{10}$ in. long, with an oval cartilaginous ring at the apex from which arises the white setose pappus; the setæ very slender, barbellate, erect, about $\frac{1}{6}$ in. long, subuniseriate, rather copious.

Huilla.—In the more elevated pastures in Morro de Lopollo, in the direction of Empalanca; fl. Dec. 1859 and March 1860. No. **3574**.

12. **S. uvens** Hiern, sp. n.

A glaucous-green very nearly glabrous somewhat fleshy decumbent herb, 7 to 9 in. high; root creeping, branched; stems numerous, simple or nearly so, prostrate for half their length or more, the flowering stems 13 to 17 in. long, secundly leafy throughout the prostrate portion, the erect part scapelike 6 to 8 in. long bracteate and nearly leafless; leaves alternate, crowded, oblong, obtuse, sessile, obscurely vesicular-rugulose, uninerved, $1\frac{1}{4}$ to 2 in. long by $\frac{1}{6}$ to $\frac{1}{4}$ in. broad; margins entire, narrowly revolute; capitula homogamous, discoid, broadly campanulate, dilated around the apex, $\frac{1}{2}$ to $\frac{2}{3}$ in. long and broad, solitary, terminal, erect; bracts narrow, $\frac{1}{4}$ to $\frac{3}{4}$ in. long, the upper ones successively smaller and less distant; involucre calyculate with a few scales similar to the uppermost bracts; involucral scales about 20, sublinear, uniseriate, inserted around the dilated receptacle, $\frac{3}{8}$ to $\frac{2}{5}$ in. long, not quite glabrous on the back, pointed at the apex with fuscous tips, the lateral margins scarious and overlapping; flowers numerous, yellow, about $\frac{1}{2}$ in. long or rather longer, all tubular, hermaphrodite; corolla $\frac{5}{8}$ to $\frac{2}{3}$ in. long, shortly 5-lobed; anthers included, obtuse and exappendiculate at both ends; style-branches about $\frac{1}{20}$ in. long, narrow, puberulous-stigmatose, terminated with very narrow exserted appendages; achenes glabrous, 10-ribbed, narrowly ovoid-oblong, rather thicker about the middle, $\frac{1}{8}$ in. long, with a ring around the apex from which arises the white copious setose pappus; the setæ very slender, $\frac{1}{3}$ in. long, minutely setulose, numerous, subuniseriate; receptacle somewhat concave, $\frac{1}{5}$ to $\frac{1}{4}$ in. in diameter, naked.

Huilla.—In swampy places at the river Cacolovar, between Ivantâla and Quilengues; fl. and fr. Feb. 1860; also by the river at Lopollo. No. **3670**.

13. **S. multicorymbosus** Klatt in Ann. Nat. Hist. Hofmus. Wien, vii. p. 103 (1892); O. Hoffm. in Bol. Soc. Brot. xiii. p. 32.

Golungo Alto.—A small tree, candelabriform, 10 to 12 ft. high; branches patent, curving upwards towards the apex and there bearing fascicles of leaves and from their centre flowering panicles 1 to $2\frac{1}{2}$ ft. long; flowers yellow, after the fashion of the genus. At the damp outskirts of forests between Cambondo and N-delle, growing in groups; fl. and fr. Oct. 1854. No. **3689**.

14. **S. subscandens** Hochst. ex A. Rich. Fl. Abyss. i. p. 434 (1847); O. & H., *l.c.*, p. 421; Bot. Mag. t. 6363 (1878).

Golungo Alto.—A perennial herb; stems solid, very delicately pulverulent with a glaucous bloom, somewhat woody at the base, 8 to 15 ft. high and more, climbing upon trees, flowering and pendulous at the extremities; leaves glaucous beneath; petioles very brittle, frequently purplish, auriculate, the auricles embracing the stem in a falcate manner; flowers ochroleucous; style-branches thickened at the apex, stigmatose-circinate throughout their length; achenes sub-compressed, thinly scattered with hairs; pappus uniseriate. The whole plant is rather fleshy, and even small bits of its branches take root with the greatest ease. In deep valleys by the Delamboa stream, climbing upon palms; fl. and fr. June 1856. No. **3691**. Scandent. By the waters of the Delamboa and Quiquele-quele; fl. and fr. July 1856. No. **3692**. A weak, climbing undershrub, with glaucous foliage. At Quiquele-quele; fl. and fr. July 1856. No. **3693**. A stem-leaf, grown in the Lumiar garden near Lisbon in 1862, of a plant introduced from this district. No. **3693***b*.

Huilla.—A bright green climbing herb, with a tuberculous root. In wooded rocky parts of Monino, not yet in fl. May 1860. From this source the plant was obtained which was grown in Hort. Kew. and which was figured in the *Botanical Magazine*. No. **3690**.

66. **OLIGOTHRIX** DC.; Benth. & Hook. f. Gen. Pl. ii. p. 452. *Xyridopsis* Welw. ex O. Hoffm., in Bol. Soc. Brot. xiii. p. 33 (1896).

1. **O. xyridopsis** O. Hoffm. *l.c.*

Huilla.—Capitula yellow. In very elevated pastures flooded in the rainy season, amidst short grass, in company with *Isoëtes* and species of *Xyris* in Morro de Lopollo; fl. April and May 1860. No. **3992**.

67. **OTHONNA** L. partly; Benth. & Hook. f. Gen. Pl. ii. p. 453.

1. **O. coriifolia** Sond. ex Harv. in Harv. & Sond. Fl. Cap. iii. p. 333 (1865).

O. Bainesii O. & H. in Oliv. Fl. Trop. Afr. iii. p. 423.

Huilla.—An undershrub or shrublet, with the habit of a *Lactuca*; stems erect, 1 to 2 ft. high, several from the same rootstock; leaves coriaceous, the blade vertical; flowers tubular, yellow. In rocky thickets near Mumpulla, at an elevation of from 4000 to 4500 ft., sporadic; fr. and few fl. Oct. 1859. No. **3991**.

2. **O. huillensis** Welw. ms. in Herb.

An erect, glaucescent, nearly glabrous shrublet, $1\frac{1}{2}$ to 4 ft. high, in the form of a little tree, rather fleshy and rigid; stem sparingly branched, filled as well as the root with a yellow resin; branches alternate, spreading, minutely glandular, densely leafy towards the apex, thick, fuscous or somewhat ashy, scarred below, the tomentum forming whitish scaly patches at the scars of the fallen leaves; leaves alternate, crowded, spathulate-oblanceolate, rounded and sometimes minutely cuspidate at the apex, attenuate at the petiolate base, $1\frac{1}{2}$ to 5 in. long (including the petiole of $\frac{1}{2}$ to 1 in.) by $\frac{1}{3}$ to $1\frac{1}{4}$ in. broad; midrib strongly marked and pallid from the base, tapering and inconspicuous towards the apex; lateral veins very slender; inflorescence

terminal, divaricately paniculate, exceeding the foliage, corymbose or sub-hemispherical, much branched, bracteate, pedunculate, 3 to 6 in. in diameter; peduncle $1\frac{1}{2}$ to 5 in. long, naked, pallid, striate; bracts mostly small and subulate, a few of the lower ones sub-foliaceous; capitula hemispherical, $\frac{1}{4}$ to $\frac{1}{2}$ in. in diameter, ecalyculate, heterogamous, radiate, numerous; ultimate pedicels $\frac{1}{2}$ to $1\frac{1}{2}$ in. long; involucral scales 5, oval-oblong, obtuse and ciliolate at the apex, scarious on the lateral margins, connate and somewhat thickened at the base $\frac{1}{6}$ to $\frac{1}{4}$ in. long; flowers yellow; female florets about 4, radiate, fertile, with a very obtuse oblong 5-nerved ligule $\frac{1}{10}$ to $\frac{1}{8}$ in. broad and short bifid style; hermaphrodite florets about 26, barren, $\frac{1}{4}$ to $\frac{1}{3}$ in. long, discoid, with a tubular shortly 5-lobed corolla, anthers scarcely exserted, shortly appendaged at the apex obtuse and exappendiculate at the base, undivided included style, and puberulous compressed ovary, surmounted by a uniseriate whitish pappus consisting of about 50 uniseriate barbellate setæ $\frac{1}{8}$ to $\frac{1}{6}$ in. long; achenes of the ray-florets $\frac{1}{6}$ in. long, $\frac{1}{12}$ in. broad, not much compressed, densely pilose, surmounted by a copious pluriseriate slightly stramineous barbellate setose pappus $\frac{1}{4}$ in. long; receptacle small, glabrous, somewhat tubercular.

Huilla.—In rocky mountainous places from Lopollo towards Jâu; fl. and fr. end of April 1860. No. **3569**. In rather dry stony hilly places between Mumpulla and Lopollo; fl. April and fr. end of May 1860. No. **3570**.

Related to *O. triplinervia* DC.; it differs by a more divaricately branched inflorescence, etc.

3. **O. arborescens** L. Sp. Pl., edit. 2, p. 1310 (1763); Harv., *l.c.*, p. 338.

Mossamedes.—A fleshy, rigid shrub, 1 to 2 ft. high, with a yellow resin; ramification sometimes pseudo-verticillate, in other cases forked; flowers apparently yellow. In dry hilly places about the Giraûl, plentiful; past flowering, nearly all the flowers having fallen, July 1859. No. **3571**.

The condition of the specimens does not enable me positively to identify them, but they agree with this species, except in the shorter peduncles, which are about 2 in. long and equal or scarcely exceed the foliage, and in this respect they resemble *O. osteospermoides* DC.; from this latter, however, they differ by the involucral scales being only 5, instead of 8; possibly they belong to an undescribed species.

4. **O. plantaginea** Hiern, sp. n.

A cæspitose perennial herb, with the habit of a *Plantago*, 7 to 9 in. high; rootstock thick, cottony, abrupt, with numerous enlarged subcylindrical fibres descending from its base; stem and the numerous radical leaves densely clothed at their base with long whitish cottony hairs; leaves rather thick and rigid; the lower ones linear-spathulate, pointed at the apex, attenuate at the base and quasi-petiolate, erect or suberect, 1- to 3-nerved, thinly cottony or glabrate, 3 to 6 in. long by $\frac{1}{8}$ to $\frac{1}{8}$ in. broad, entire; cauline leaves few, smaller, linear-lanceolate or subulate; capitula broadly campanulate, inconspicuously radiate, solitary,

terminating the scapelike stem, $\frac{5}{8}$ to $\frac{2}{3}$ in. long, quasi-calyculate with a few subulate bracteoles, about $\frac{1}{4}$ in. long, woolly at the base; involucral scales about 20, uniseriate, lanceolate-linear, thinly woolly or puberulous on the back, scarious on the margins, $\frac{3}{8}$ in. long or rather more, each arising from the exterior circumference of the receptacle just above thickened points or adpressed squamulæ; flowers numerous, yellow; the outermost ones female, fertile, shortly ligulate, with exappendiculate recurving style-branches; the inner ones numerous, discoid, apparently barren, hermaphrodite; the corollas tubular, $\frac{1}{3}$ to $\frac{3}{8}$ in. long, gradually widening in the upper half, shortly 5-lobed, the tube scattered with some short hairs; the lobes lanceolate, obtuse, thickened and dark at the tip; the anthers included or nearly so, $\frac{1}{16}$ in. long, scarcely appendaged at the apex, subobtuse and exappendiculate at the base but the upper halves of the filaments thickened; style included, not branched, only notched at the apex; young achenes rather slender, $\frac{1}{4}$ in. long or nearly so, 10-ribbed or -striate, setulose, with a narrow whitish cartilaginous ring round the apex from which arises the copious white setose pappus; the setæ $\frac{1}{3}$ in. long, subuniseriate, slender, minutely barbellate.

HUILLA.—In sandy pastures above Mumpulla, among low bushes, rather rare; 4000 ft. elevation; fl. and young fr. Oct. 1859. No. **3634**.

Nearly related to *O. scapigera* Harv.; it has much more numerous involucral scales.

5. **O. gracilis** Hiern, sp. n.

A slender, erect or ascending, glabrous or subglabrous, glaucescent herb; root annual or thickened and possibly perennial; stem slender, 9 to 18 in. high, leafy at the base; branches alternate, ascending, somewhat leafy; leaves alternate, rather fleshy, narrowly linear-subulate, sessile, ranging up to 3 in. long; entire and revolute on the margin; capitula campanulate-cylindrical, dilated at the apex during the flowering, discoid, about 25-flowered, $\frac{1}{3}$ in. long, numerous, ecalyculate, on slender, naked or slightly bracteate pedicels ranging up to $1\frac{2}{3}$ in. long, arranged in a rather lax terminal corymbose cyme of 2 to 8 in. in diameter; bracts small, subulate; involucral scales 8, uniseriate, linear-oblong, pointed at the apex, scarious on the lateral margins, $\frac{1}{5}$ to $\frac{1}{4}$ in. long, erect, cohering at the base for a short distance, at length after the fall of the fruit separating and spreading; flowers yellowish, perhaps all hermaphrodite; about $\frac{1}{4}$ in. long, corolla tubular, exceeding the involucre, shortly 5-lobed, the outer ones somewhat spreading; anthers shortly exserted, narrowed, obtuse and not appendaged at the base; style undivided or style-branches very short, truncate and stigmatose at the apex, not appendaged, equalling the corolla; achenes $\frac{1}{12}$ in. long, glabrous, subterete, smooth; setæ of the pappus very slender, white, rather copious, subuniseriate, about $\frac{1}{8}$ in. long, minutely barbellate; receptacle narrow.

HUILLA.—In moist sandy pastures near Nene, after the first rains: fl. Oct. 1859. No. **3671**. Fl. and fr. Dec. 1859 and Jan. 1860. No. **3672**.

6. **O. brachyanthera** Hiern, sp. n.

An erect rigid herb, resembling a *Senecio* in habit; rootstock thick, dark, oblong or ovoid, glabrous, with numerous stiff erect long glabrous often blackened bristles (apparently the remains of the petioles of the leaves of previous seasons) at the apex, abrupt and with several diverging more or less thickened fibres at the base; stems several, simple and undivided up to the inflorescence, yellowish-green or towards the base purplish, striate-sulcate, straight or nearly so, glabrate or obsoletely or somewhat cottony, leafy, 1 to 2 ft. high; radical leaves obovate or oblanceolate, yellowish-green, rounded and sometimes minutely mucronulate at the apex, attenuate to the petiolate base, herbaceous, crenulate, more or less floccose especially beneath when young, with loose white cotton, soon glabrate, ranging up to 10½ in. long (including the petiole) by 1½ in. broad or more; stem-leaves alternate, obovate narrowly elliptical or lanceolate, obtuse or the upper ones subacute, more or less narrowed to the sessile base, herbaceous, yellowish-green, crenulate or the uppermost ones minutely so, glabrate or obsoletely floccose, suberect, ranging up to 4½ in. long by 2 in. broad; capitula discoid, campanulate, ⅝ to ½ in. long, erect, many-flowered, quasi-calyculate at the base, on unequal slightly cottony pedicels ranging up to 1 in. long and rather densely arranged in a flat-topped bracteate branched terminal cyme of 2 to 3 in. in diameter; bracts narrow, the lower ones like the uppermost leaves and the upper ones like the scales at the base of the involucre: flowers yellow; scales of the quasi-calyculus subulate, small, few; involucral scales 11 to 14, narrowly oblong, thinly hairy on the back, straminous except the dark ciliolate pointed tip, equal, imbricate, uniseriate, rigidly subscarious on the lateral margins, ⅕ to ¼ in. long, united at the base around the top of the nearly naked or papillose not squamose receptacle; flowers numerous, yellow, tubular, rather exceeding the involucre, about ⅜ in. long; corolla ⅓ to ¼ in. long, glabrous, bullate at the base, funnel-shaped above the middle, 5-lobed; the lobes lanceolate, thickened along the margins and at the darker tips; anthers about $\frac{1}{40}$ in. long, cohering near the apex, shorter than the slender filaments, shortly appendaged at the apex, obtuse and exappendiculate at the base, included; style included or nearly so, darker than the corolla or stamens, not branched, only notched at the apex, included, about equalling or a little exceeding the anthers; achenes ⅛ to $\frac{1}{6}$ in. long, oblong or at length oval and somewhat compressed, somewhat pubescent, marked with about 10 longitudinal ribs, each rib consisting of 2 adjacent parallel lines; pappus whitish, copious, deciduous, about ⅕ in. long, setose; the setæ subuniseriate, very slender, minutely barbellate; nectary at the base of the style bullate.

Huilla.—In the drier thickets about Lopollo, in company with Thymelæaceæ; fl. and fr. end of Nov. 1859. No. **3683**. In shrubby places near Lopollo; fl. and fr. Dec. 1859. No. **3682**.

The quasi-calyculus is exceptional in *Othonna* and gives the capitula

an appearance like *Senecio*, but the absence of style-branches inclines towards the former genus.

Tribe IX.—Calenduleæ.

68. **TRIPTERIS** Less.; Benth. & Hook. f. Gen. Pl. ii. p. 455.

1. **T. amplexicaulis** Less. Syn. Gen. Comp. p. 90 (1832); non DC. *Calendula amplexicaulis* Thunb. Prodr. Pl. Cap. p. 164 (1800); Harv. in Harv. & Sond. Fl. Cap. iii. p. 427 (1865).

Huilla.—In sunny thickets between Mumpulla and Nene; fl. and fr. Oct. 1859; Lopollo, Dec. 1859. No. **3541**. A perennial, sparingly branched herb, 1 to 3 ft. high; flowers yellow; fruiting capitula nodding or almost pendulous. In the sunny wooded parts of the Monino country; fl. and fr. May 1863. No. **3540**.

I have not seen Thunberg's type of this species, but Harvey's description, *l.c.*, agrees fairly well with our specimens.

2. **T. microcarpa** Harv., *l.c.*

Mossamedes.—An aromatic, viscid, annual herb; stem erect, branched at the apex; leaves rather fleshy; florets yellow. In rocky, hilly, submaritime situations, near Santo Antonio; fl. and fr. 21 July 1859. No. **3542**.

69. **OSTEOSPERMUM** L.; Benth & Hook. f. Gen. Pl. ii. p. 455.

1. **O. muricatum** E. Mey. ex DC. Prodr. vi. p. 464 (1837); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 425; O. Hoffm. in Bol. Soc. Brot. x. p. 179 (1893).

Huilla.—A very viscid herb, strongly scented, with a woody perennial root, and small yellow-flowered capitula. In rather dry, sunny, bushy situations at the river Monino; fl. and fr. end of Nov. 1859. No. **3539**. A perennial herb, scarcely a foot high, with a woody root, spreading branches, subpinnatifid leaves and small white flowers. In dry places along the river Monino; fr. Feb. 1860. The ripe achenes are $\frac{1}{6}$ in. long, glabrous, rather shining, very hard, obliquely obovoid, irregularly pentagonal, and scored across two or three obtuse angles with several incised transverse furrows. Coll. Carp. 688.

Tribe X.—Arctotideæ.

70. **MERIDIANA** Hill, Veg. Syst. ii. p. 121** (1761), and Hort. Kew. p. 26 (1768); non L. f. (1781).

Gazania Gaertn. Fruct. ii. p. 451, t. 173, fig. 2 (1791); Benth. & Hook. f. Gen. Pl. ii. p. 459.

1. **M. longifolia** O. Kuntze, Rev. Gen. Pl. i. p. 353 (1891).

Gazania longifolia Less. Syn. Gen. Comp. p. 48 (1832); Harv. in Harv. & Sond. iii. p. 477 (1865).

Huilla.—Flowers yellow; the ligules yellow inside, purple outside. In sandy pastures among low bushes, near Lopollo, at an elevation of 5000 ft.; fl. Dec. 1859, foliage (linear, ranging up to near a foot long) March 1860. No. **3704**.

This determination is doubtful as I have not seen the type of the species; our specimen should also be compared with *M. serrulata* O. K., *l.c.* (*G. serrulata* DC.; O. & H. in Fl. Trop. Afr. iii. p. 428),

although in the latter species the inner involucral scales are said to be taper-pointed, and in our plant they are obtuse.

71. **BERKHEYOPSIS** O. Hoffm. in Engl. & Prantl, Nat. Pflanzenfam. iv. 5, p. 311 (1892).

1. **B. aizoides** O. Hoffm. in Bol. Soc. Brot. x. p. 180 (1893).

Mossamedes.—Flowers yellow. In gravelly hilly maritime places at Praia da Amelia, etc., plentiful; fl. and fr. July and August 1859. No. **3707**.

Huilla.—A herb with the habit of a *Calendula*; flowers yellow. In sandy, sparingly bushy pastures, near Nene; fl. and fr. Jan. 1860. A form with a more compact habit and longer linear leaves, perhaps belonging here. No. **3708**.

2. **B. angolensis** O. Hoffm., *l.c.*

Mossamedes.—Habit and pappus suggestive of *Berkheya* but the involucral scales connate nearly to the middle after the manner of *Meridiana*. In maritime thickets to the south of Villa de Mossamedes, at Praia da Amelia; fl. and fr. July 1859. No. **3705**. In the sandy maritime parts of the Giraûl, in company with various seaside plants; fl. and fr. 9 Sept. 1859. No. **3706**.

Huilla.—Flowers yellow. In pastures on a sandy clay soil, near Lopollo; fl. Dec, 1859. No. **3709**. This No. is quoted by O. Hoffmann, *l.c.*, for the species, but the absence of ripe fruit does not enable satisfactory identification; so far as I can judge from the specimens they much resemble a *Gorteria*, especially *G. diffusa* Thunb.

72. **CROCODILOIDES** Adans. Fam. Pl. ii. p. 127 (1763).

Berkheya Ehrh. Beitr. iii. p. 137 (1788); Benth. & Hook. f. Gen. Pl. ii. p. 460.

1. **C. Autunesii.**

Berkheya Autunesii O. Hoffm. in Bol. Soc. Brot. x. p. 181.

Pungo Andongo.—A perennial herb, with numerous oblique or ascending stems and yellow flowers. In wooded thickets at the banks of the rivers Cuanza and Luxillo, and near Lombe, plentiful; fl. and fr. March 1857. No. **3605**. In sandy bushy places between Caghuy and the river Cuanza; not yet in open fl. April 1857. No. **3606**.

Huilla.—Flowers yellow. In sunny parts of the forest between Eme and Ivantâla; not yet in full flower April 1860, and not seen subsequently. No. **3604**.

2. **C. Welwitschii.**

Berkheya Welwitschii O. Hoffm., *l.c.*, p. 182.

Huilla.—A cæspitose plant, a foot high, with deep-yellow flowers. In sandy thickets along the outskirts of forests between Eme and the lake of Ivantâla; fr. after the previous year's fl. end of Feb. and March 1860; fl. April 1860. No. **3712**. A perennial herb, 2 ft. high, with the habit of the caulescent species of *Carlina*; stems numerous; flowers large, golden-yellow. In sandy thickets near Lopollo fr. April 1860. Coll. Carp. 57.

3. **C. carlinopsis.**

Berkheya carlinopsis Welw. ex O. Hoffm. in Bol. Soc. Brot. xiii. p. 34 (1896).

Huilla.—A plant 4 to 5 ft. high, branched towards the apex, apparently perennial; flowers yellow. At Ferrão da Sola towards Catumba; fl. and fr. Feb. and May 1860. No. **3711**. The leaves range up to 4 in. long.

4. **C. andongensis** Hiern, sp. n.

An erect herb, 3 to 4 ft. high and more, branched near the top, apparently annual; stem strict, purplish, sulcate-striate, subterete, pithy, more or less thinly clothed as well as the short ascending branches, with a soft fugitive white floccose cotton, leafy throughout; leaves alternate, narrowly elliptical, bristle-pointed at the apex, cuneate or the upper ones obtuse at the sessile or subsessile base, green scabrid and scattered above with short close-lying pimple-based rigid hairs, whitish felted beneath, not lobed, 2 to 5 in. long by $\frac{1}{3}$ to 1 in. broad, not decurrent, the margin biserrulate with all the teeth small and terminating in setaceous straight bristles; capitula hemispherical, heterogamous, radiate, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. in diameter, usually subgeminate on unequal short whitish-felted pedicels of $\frac{1}{2}$ to 1 in. long, arranged in several-headed corymbose terminal cymes of about 4 to 6 in. in diameter; common peduncle $\frac{1}{2}$ to 6 in long; involucral scales pluriseriate, spinous-toothed with the prickles patent and glabrous, thinly white-felted on the back, connate near the base; the outer ones subfoliaceous, linear-lanceolate or including the nearly straight rigid acute prickles ovate in outline, about $\frac{5}{8}$ in. long; flowers of a straw-yellow colour; ray-florets uniseriate, neuter, about an inch long, styleless; the ligule linear, 5-nerved; the ovary rudimentary, surmounted by a few unequal fringed paleæ; disk-florets multiseriate, hermaphrodite, fertile, about $\frac{1}{2}$ in. long, tubular; the corolla 5-fid, with linear-oblong lobes, the lobes thickened along the valvate margins; the anthers nearly equalling the corolla, shortly appendaged at the apex, shortly caudate at the base; style branches rather long, exserted, somewhat pointed, minutely papillose, not appendaged; ovary densely clothed with whitish silky hairs, embedded in the pits of the fleshy receptacle, rather short; the pits of the receptacle toothed on the margin with unequal paleaceous acute teeth; pappus paleaceous; the paleæ about 20, biseriate, oblanceolate $\frac{1}{10}$ in. long, ciliolate-fringed, obtuse, silky-setulose on the back, subequal.

Pungo Andongo.—In sandy thickets to the west of the præsidium and near Quitage, not uncommon; fl. Jan. 1857. No. **3713**.

This species is nearly related to *C. Spekeana* (Oliv.); it has been collected by Capello, n. 19, in the interior of Angola, where the local name is "Guicualo"; it differs from *C. angolensis* (O. Hoffm.) by its herbaceous annual habit.

5. **C. gracilis.**

Berkheya gracilis O. Hoffm., *l.c.*, p. 35.

Huilla.—Flowers sulphur-coloured. In sunny rocky mountainous parts of Morro de Lopollo, plentiful; fl. and fr. end of April 1860. No. **3710**.

Tribe XI.—Mutisiaceæ.

73. **PLEIOTAXIS** Steetz; Benth. & Hook. f. Gen. Pl. ii. p. 487.

1. **P. pulcherrima** Steetz in Peters, Mossamb. Bot. p. 500, t. 51 (1863); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 440; O. Hoffm. in Engl. Bot. Jahrb. xv. p. 536 (1893).

Pungo Andongo.—A perennial herb; rootstock woody-tuberous, with long stout fibres; leaves coriaceous, green, smooth and strongly shining above; flowers of a deep blood-red colour, distantly resembling those of a *Dianthus*. In open wooded places near Mangue; fl. and fr. March 1857. No. **3890**, and Coll. Carp. 674.

2. **P. rugosa** O. Hoffm., *l.c.*, p. 538, and in Bol. Soc. Brot. x. p. 183 (1893).

Golungo Alto.—A very beautiful perennial herb, 2½ to nearly 4 ft. high; rootstock thick, woody, many-headed; stem erect, sometimes simple and one-headed, in other cases branched and 3- to 5-headed; leaves rigid, thick, not succulent, dry, deep green above, whitish tomentose or clothed with a silky wool beneath; involucral scales red-purple; florets brilliant, from orange to cinnabar-red. In thinly bushy and sparingly grassy places on the elevated slopes among the mountains of Sobato de Bumba and of Queta; fl. and fr. 1855. Native name "Haca," which is apparently used in a collective sense, as, for instance, for *Dicoma anomala*. No. **3887**. Suffruticose, fulgent; habit that of a *Centaurea*. Mountains of Alto Queta; fr. March. Coll. Carp. 671.

Var. **auriculata** (Welw.).

Leaves conspicuously amplexicaul and auriculate.

Pungo Andongo.—An erect, sparingly branched, perennial herb; leaves deeply rugulose, bright green without gloss above, hoary-silky beneath; corolla bright scarlet, as are also the stigmas; anther-tube yellowish. In the more elevated bushy part of the præsidium; fl. and fr. middle of Dec. 1856. Only one specimen in the herbarium. No. **3888**. In 10 fully ripe capitula only 27 per cent. of the seeds were found good. Coll. Carp. 675.

3. **P. eximia** O. Hoffm., *l.c.*, p. 539.

P. pulcherrima Klatt in Ann. Nat. Hofmus. Wien, vii. p. 104 (1892); non Steetz.

Golungo Alto.—Flowers red-scarlet. Coll. Carp. 672.

Pungo Andongo.—A handsome perennial herb, 2 ft. high, obsoletely branched; leaves broad; capitula large; corolla orange-scarlet as are also the stigmas. At Muxillo Guinga in the præsidium; fl. and fr. middle of Dec. 1856. No. **3889**. Fr. May 1857. Coll. Carp. 676.

The following No. is also referred by O. Hoffmann to this species; see Bol. Soc. Brot. xiii. p. 35 (1896):—

Golungo Alto.—A very beautiful shrub, 3 to 5 ft. high, woody at the base, patently branched; capitulum homogamous; florets scarlet, all hermaphrodite, equal; corolla-tube long, the limb 5-cleft; anthers caudate, the tails very delicate, capitulate, more or less cohering with the filaments, downy-pilose; achenes linear-oblong very sparingly pilose, canaliculate; pappus setose, equalling the corolla-tube; receptacle alveolate, the alveolæ more or less fringed or appendaged

on the margin. On elevated parts of the mountains of Alto Queta, sparingly. No. **3893**. Queta, fr.; Sept. 1855. COLL. CARP. 673.

4. **P. Autunesii** O. Hoffm., *l.c.*, p. 539, and in Bol. Soc. Brot. x. p. 183 (1893).

HUILLA.—Flowers shining, blood-red. At the bushy drier outskirts of the forests of Monino; fl. and fr. April and May 1860. No. **3892**. In hilly herbaceous places by the lake Ivantâla, rather rare; fl. and fr. Feb. 1860. Apparently belonging to the species, although the achenes are glabrous or obsoletely hairy. No. **3891**. A suffrutescent herb with rufous-fuscous pappus; fr. without fl. May 1860. Possibly a form of this species with glabrous achenes, but the achenes are shorter than in the above Nos.; it should also be compared with *Vernonia*. COLL. CARP. 691.

5. **P. fulva** Hiern, sp. n.

An erect, soft tawny-tomentose undershrub, 2 or 3 ft. high or more; rootstock woody; stems several, strict, leafy, simple below, branched above about the inflorescence; branches spreading, alternate; leaves narrowly elliptic-oblong, alternate, spreading, pointed or apiculate at the apex, somewhat narrowed at the base, sessile or subsessile, coriaceous, rigid, pale-green rugulose with impressed venation and reticulation and thinly woolly above, tawny-woolly beneath, minutely crenulate-denticulate on the margin, $1\frac{1}{2}$ to 3 in. long by $\frac{1}{5}$ to $\frac{1}{2}$ in. broad; capitula oblong, homogamous, about $\frac{7}{8}$ in. long, sessile or on short pedicels, in spikelike racemes terminal and in the upper axils, arranged in a flat-topped oblong somewhat leafy and bracteate terminal cyme 6 to 9 in. long; bracts like the leaves but much smaller; involucral scales pluriseriate, more or less oblong, obtuse, free to the base, tawny-woolly on the back, glabrous and shining inside, coriaceous, the innermost ones linear-oblong about $\frac{1}{2}$ in. long, the outer ones successively shorter, the outermost ones broadly ovate-oblong and short; flowers rosy-violet in colour; florets all hermaphrodite and tubular, comparatively few, about $\frac{5}{6}$ in. long; corolla-tube slender, rather suddenly dilated near the apex, pentamerous; lobes linear, $\frac{1}{6}$ in. long; anthers exserted, acuminate at the apex, with fimbriate tails at the base; style-branches exserted, short, curving outwards, each with a minute broad very obtuse appendage; achene (young) oblong angular, adpressedly pilose, $\frac{1}{6}$ in. long; pappus nearly $\frac{1}{2}$ in. long, setose, whitish or slightly straw-coloured, pauciseriate; the setæ somewhat unequal in length, setulose; receptacle papillose.

PUNGO ANDONGO.—In the drier forests, in sunny spots between Calunda and Mangue; fl. March 1857. No. **3274**.

There is in the Carpological Collection a capitulum in fruit, which I cannot assign to any of the previous species; it should be compared with *P. Newtoni* O. Hoffm., *l.c.*, p. 537, the type of which was obtained in Serra da Chella, but of which I have seen no authentic example; I append a description of Welwitsch's specimen, including his note thereon:—

A herb with the habit of a *Centaurea*, rarely caulescent; radical leaves massed together, erect; scapes with but few leaves; capitulum solitary, very large; fruiting involucre spreading, 2 in. in diameter; involucral scales pluriseriate, imbricate, minutely ciliate, scattered on the back with minute adpressed hairs, glabrous within, the outermost ones ovate-obtuse or subacute short, the inner ones lanceolate longer, the innermost ones linear, pointed, $\frac{3}{4}$ in. long; florets numerous, deep blue; achenes $\frac{2}{3}$ to $\frac{1}{2}$ in. long, longitudinally and unequally 12-ribbed, sublinear, narrowed and often a little curved towards the base, subcompressed, very sparingly pilose with short adpressed hairs; pappus $\frac{1}{2}$ to $\frac{2}{3}$ in. long, of a slight rufous straw-colour, pauciseriate, setose; the setæ unequal, minutely setulose; fruiting receptacle $\frac{1}{2}$ in. in diameter, areolate, with depressions in the intervals, the edges of the areolæ shortly fimbriate.

Huilla.—In rather dry thickets near Huilla, plentiful; fr. Nov. 1859. Coll. Carp. 677.

74. **ERYTHROCEPHALUM** Benth. in Benth. & Hook. f. Gen. Pl. ii. p. 488 (1873).

Hæmastegia Klatt in Annal. Naturhist. Wien, vii. p. 102 (1892). *Megalotheca* Welw. ex O. Hoffm. in Engl. Bot. Jahrb. xv. p. 541 (1893).

1. **E. dianthiflorum** O. Hoffm., *l.c.*, and in Bol. Soc. Brot. x. p. 183 (1893).

Megalotheca dianthiflora Welw., *l.c.*

Pungo Andongo.—A perennial herb, with a habit slightly Carduacous; stems slender, simple and one-headed or branched from the middle and several-headed; capitula homogamous, many-flowered, bright purple throughout except the anthers; involucre campanulate; the scales imbricate, pluriseriate, broadly lanceolate and crowded at the base, from the middle towards the apex lanceolate and rather lax, the outer ones shorter, mostly much acuminate, the inner ones elongated, liguliform, rather obtuse, spinulose-denticulate especially towards the apex; florets all tubular, blood-red; the corolla glabrous, pentagonal at the bottom, then abruptly contracted into the filiform tube and at the top abruptly again dilated into the shorter widely campanulate 5-cleft limb; the lobes shorter than the tube, reflexed, triangular lanceolate; anthers exserted, rather rigid, loosely cohering, appendaged at the apex each with an erect oblong-globose stipitate gland, caudate at the base; the tails fimbriate-lacerate at the tip, pilose, empty, pellucid, nearly flat, broadly linear; filaments naked, inserted in the bottom of the corolla-throat, nearly flat; pollen spherical, tolerably large, coarsely echinate; ovary somewhat compressed, subpentagonal or rarely hexagonal, oblong, narrowed-subtruncate at both ends, pilose especially on the angles, surmounted by 5 or rarely 6 compressed unequal narrowly linear-lanceolate much acuminate deciduous paleæ which are pilose-serrulate on the margin and more or less as long as the corolla-tube; style red, strong, glabrous; its branches semi-cylindrical, flat inside, with a semicircular ring of hairs below the apex; achene glabrate or pubescent, much larger than the ovary, very hard, ovoid-oblong, obtusely 5- or 6-angled, brown, truncate at the apex surmounted by the small cyathiform 5-crenate nectary; the angles thick, obtuse, more prominent near the base, gibbous-protruded at the apex; pappus obsolete; receptacle paleaceous, the paleæ more or less similar to the involucral scales, nearly flat, strongly

spinulose-denticulate. In wooded copses not far from Mangue by the way towards Candumba, at an elevation of 3500 ft. ; fl. and fr. March 1857. Colonial name "Cravos do mato" (forest pink). The plant furnishes excellent tinder. No. **4000** partly.

Huilla.—In sandy thickets at the outskirts of rather open forests between Eme or Munchimo and the lake Ivantâla, by no means plentiful ; fl. and fr. March and April 1860. No. **4000** partly.

Hoffmann in the place first cited quoted in error No. "4022 (?)" for this plant.

75. **DICOMA** Cass. ; Benth. & Hook. f. Gen. Pl. ii. p. 492.

1. **D. tomentosa** Cass. in Bull. Soc. Philom. (1818), p. 47 ; O. & H. in Oliv. Fl. Trop. Afr. iii. p. 443 ; O. Hoffm. in Engl. Bot. Jahrb. xv. p. 543 (1893).

Loanda.—In sandy mint-beds about Maianga do Povo ; fl. and fr. Feb. 1858. No. **3622**.

Icolo e Bengo and Zenza do Golungo.—A herb, usually erect but in old age not uncommonly decumbent ; branches crowded, ascending ; florets very fugacious. On a sandy clay soil, in places flooded in the rainy season, about the Lagôas de Funda, plentiful ; also in Zenza do Golungo ; fl. and fr. Sept. 1857. No. **3623**.

Bumbo.—In rough sunny situations near Bumbo, beginning of June 1860 ; only one specimen collected. No. **3990**.

Huilla.—In sunny rocky places near Mumpulla ; very young fl.-bud Oct. 1859 ; only two plants seen, perhaps more plentiful in summer. Apparently this species. No. **3608**.

2. **D. foliosa** O. Hoffm., *l.c.*, p. 543, and in Bull. Soc. Brot. x. . 184 (1893).

Mossamedes.—At the calcareous sand-rocks along the banks of the river Bero near Garganta do Rio Bero ; fl. and fr. July 1859. No. **3617**. A lovely shrublet, with numerous stems widely and densely spreading from its many-headed rootstock, scarcely a foot high, recalling some species of *Elichrysa* ; flowers tubular-campanulate, of a pleasant purple colour ; achenes remarkable on account of the structure of their pappus. In rocky places at the base of Montes negros, in company with *Sarcocaulon mossamedense* (Welw. herb. n. 1607) ; fl. and fr. 10 Aug. 1859. No. **3618**. An annual or gradually turning woody and biennial, with Gnaphalioid habit, the sole ornament of the very gloomy Black Mountains (Serra de Montes negros) ; fl.-bud 13 Aug. 1859. No. **3619**.

3. **D. elegans** Welw. ex O. Hoffm., *ll.cc.*, p. 544, p. 184.

Huilla.—In thin bushy forests between Mumpulla and Nene ; fr. Oct. 1859. No. **3620**. In open forests en a sandy soil near Nene, in company with species of Sterculiaceæ, Leguminosæ, and other Compositæ ; not yet in open fl. in May 1860. No. **3621**.

4. **D. Welwitschii** O. Hoffm., *ll.cc.*, p. 544, p. 184.

Pungo Andongo.—An erect branched herb, becoming woody at the base ; stems numerous from a very hard woody-tuberous rootstock ; flowers of a pale straw-colour ; style exserted after the opening of the flowers ; stigma clavate, with two long cohering lobes. In sandy open woods near Mopopo and Sansamanda ; fl. and fr. 1 May 1857. No. **3609**.

5. **D. anomala** Sond. in Linnæa xxiii. p. 71 (1850) (*anomalum*); O. & H., *l.c.*, p. 443.

Golungo Alto.—Habit of a *Carlina*; rhizome very thick, 2 to 3 in. in diameter, spongy; stems prostrate; florets purplish, much shorter than the involucre. On the northern sunny slopes of the mountains of Alto Queta; fl. and fr. beginning of June 1855. No. **3607**. Rootstock woody, thick, many-headed; stems prostrate-ascending. On the dry more elevated declivities of the mountains of the central Queta, Carengue; fl. and fr. Nov. 1855. No. **3613**. On the rocky slopes of Alta Queta among short grass; fl. and fr. June 1856. No. **3614**. Native name "Háca," which is also used in this district for *Pleiotaxis rugosa*: see Ficalho, Pl. Uteis, p. 209 (1884).

Var. **karaguensis** O. & H., *l.c.*; O. Hoffm. in Bol. Soc. Brot. x. p. 185 (1893). *D. karaguensis* Oliv. in Trans. Linn. Soc. xxix. p. 103, t. 70 (1873).

Huilla.—In open gravelly pastures near Mumpulla; fl. and fr. Oct. 1859. No. **3610**. A rather rigid herb; stems numerous; leaves spreading, green above, whitish beneath; florets rosy, 5-cleft, with erect patent-lobes revolute at the tips. In sandy thickets near the Monino; fl. Feb. 1860. No. **3611**. A perennial herb, with the habit of the caulescent *Carlinæ*, a foot high; rootstock thick, woody, several-headed; stems 2 to 5, erect; branches corymbose; capitula terminal; florets tubular, purple; corolla-lobes linear, circinate-revolute; anthers paleaceous; style rather thick, straight, cylindrical, simple, scarcely bifid; stigma capitate, scarcely or slightly bifid or emarginate at the apex; receptacle flat, deeply alveolate. In hilly bushy sandy places near Lopollo, plentiful; fl. and fr. March 1860. No. **3612**.

6. **D. plantaginifolia** O. Hoffm. in Engl., *l.c.*, p. 546.

Pungo Andongo.—A perennial herb; radical leaves adpressed to the ground, the flowers unfortunately not yet developed, nor even the stem. In bushy pastures at the banks of the river Cuanza, sparingly; in very young fl.-bud March 1857. Apparently this species, of which I have not seen a type specimen. No. **3615**.

7. **D. nana** Welw. ms. in herb.

A dwarf perennial rigid plant, about 2 in. high; rootstock somewhat woody and præmorse, giving off numerous cord-like fibres, simple or divided at the apex; stem very abbreviated, less than 1 in. long, suffrutescent, simple and erect or divided with very short diverging branches, clothed with the clasping leaf-bases or their remains; leaves crowded, obovate, shortly cuspidate or rounded at the apex, wedge-shaped towards the quasi-petiolate clasping base, rigidly subherbaceous, subentire, minutely toothed, 3- or 5-nerved at or near the base and 3-nerved rather above the base, closely reticulate greenish subglabrous and minutely glandular-scaly above, whitish with appressedly cottony felt beneath, $1\frac{1}{2}$ to 3 in. long by $\frac{1}{2}$ to $1\frac{5}{8}$ in. broad, more or less spreading; capitula broadly campanulate, $1\frac{1}{4}$ in. long, many-flowered, apparently homogamous, terminal or subterminal and axillary or lateral, sessile, solitary or approximated; involucre 1 to $1\frac{1}{8}$ in. long; involucral scales multiseriate, imbricate, dryly coriaceous, rigid, with subscarious lateral margins, glabrous, shining, pungent at

the apex, lanceolate or oblong-linear, erect or adpressed, the outer short, the inner successively longer, some $\frac{3}{5}$ in. long; corolla tubular, deeply 5-lobed; the lobes sublinear, narrowed gradually to the scarcely acute apex; anthers rather shorter than the corolla-lobes, with lanceolate appendages at the apex and long narrow fringed ciliate acute tails at the base; style included, subclavate, notched at the apex; achenes densely pilose-setulose, $\frac{1}{6}$ in. long; pappus pluriseriate, wholly setose, $\frac{1}{3}$ to $\frac{3}{8}$ in. long; the setæ whitish, unequally long, plumose.

Huilla.—In the drier pastures about Lopollo and Mumpulla, abundant; not yet in fl. Oct. 1859; one specimen in fl. and fr. May 1860. No. **3616.**

76. **PERDICIUM** L. Diss. Pl. Rar. Afr. p. 22, n. 72 (Dec. 1760). *Gerbera* Gronov. ex L. Cor. Gen. Pl. p. 16 (1737); Benth. & Hook. f. Gen. Pl. ii. p. 497. *Gerberia* Cass. in Bull. Soc. Philom. 1817, p. 34 (Feb.).

1. **P. piloselloides.**

Arnica piloselloides L., *l.c.*, p. 22, n. 73. *Gerberia piloselloides* Cass. in Dict. Sc. Nat. xviii. p. 461 (1820); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 445 (*Gerbera*); O. Hoffm. in Eng. Bot. Jahrb. xv. p. 546 (1893); and in Bol. Soc. Brot. xiii. p. 35 (1896).

Pungo Andongo.—A perennial stemless herb, with the habit of a *Scorzonera*; root-fibres fleshy, fasciculate; scape erect; capitula nodding. In thickets about the præsidium, sporadic; fl. and fr. Dec. 1856. No. **3598.**

Huilla.—Flowers white-violaceous in colour. In bushy rocky sparingly herbaceous places near Lopollo at the river; fl. and fr. Nov. and Dec. 1859. No. **3597.** The scapes range up to 15 in. long.

2. **P. abyssinicum.**

Gerbera abyssinica Schultz, Bip. ex A. Rich. Fl. Abyss. i. p. 458 (1847); O. & H., *l.c.*, p. 445; O. Hoffm. in Engl., *l.c.*, p. 547; and in Bol. Soc. Brot., *l.c.*, p. 185.

Pungo Andongo.—A perennial, cæspitose, stemless herb; rhizome becoming rather woody; scapes erect; capitula somewhat nodding; flowers yellow. In dense sandy thickets between Pungo Andongo and the river Lutete; fl. and fr. Oct. 1896. No. **3599.** Rootstock perennial, many-headed; habit almost of *Apargia*; flowers golden-yellow; widely cæspitose in sandy bushy or wooded places between the præsidium and the river Cuanza; fl. and young fr. middle of Dec. 1856. No. **3600.**

Huilla.—Flowers yellow. In thinly bushy places along the right bank of the Lopollo river; fl. and fr. Dec. 1859. No. **3602.** In the drier thickets on the right bank of the Lopollo stream; fl. Dec. 1859. No. **3603.** In bushy pastures near Lopollo towards Jâu; fl. Jan. and Feb. 1860. Receptacle plane-convex, somewhat alveolate, scattered with a few short teeth. No. **3601,**

Tribe XII.—Cichoriaceæ.

77. **TOLPIS** Adans.; Benth. & Hook. f. Gen. Pl. iii. p. 508.

1. **T. fruticosa** Schrank, Pl. Rar. Hort. Monac. n. 46 c. tab. (1819). *Crepis filiformis* Ait. Hort. Kew., edit. 1, iii. p. 128 (1789).

C. succulenta Ait., *l.c.* *Hieracium fruticosum* Willd. Sp. Pl. iii. 1591 (1800). *T. filiformis* DC. Prodr. vii. p. 87 (1838). *T. succulenta* Lowe, Fl. Mad. i. p. 525 (1868).

Var. **multifida** (Lowe, *l.c.*, p. 527).

Island of Madeira.—A somewhat shrubby herb, 6 to 18 in. high, with pretty yellow flowers. In stony places between Funchal and Camara dos Lobos, plentiful; fl. and fr. August 1853. No. **3624**.

78. **CREPIS** L.; Benth. & Hook. f. Gen Pl. ii. p. 513.

1. **C. bumbensis** Hiern, sp. n.

A perennial herb, about a foot high or a little more; root subnapiform, $\frac{2}{5}$ in. thick; leaves all radical or nearly so, forming a rosette, oblanceolate, not lobed, denticulate-repand, usually rounded and minutely mucronulate at the apex, wedge-shaped towards the sessile or scarcely petiolate somewhat dilated or clasping base, thinly herbaceous, green and minutely or obsoletely glandular-scaly on both faces, scattered beneath with some broad-based simple short inconspicuous hairs, 2 to $2\frac{1}{2}$ in. long by $\frac{2}{5}$ to $\frac{3}{5}$ in. broad; stems several, scapiform, loosely and dichotomously divided about thrice from near the base upwards, bracteate, rather slender, shining, nearly glabrous, erect or ascending; the ultimate branches pedunculiform, 1 to $5\frac{1}{4}$ in. long and puberulous about the apex; bracts small, from a clasping or sessile base, narrow or subulate, the upper ones smaller; capitula many-flowered, campanulate in flower, rather oblong in fruit, $\frac{1}{4}$ to $\frac{1}{3}$ in. broad; singly terminating the branches of the scapelike stem, erect, calyculate; the scales of the calyculus about 7, unequal, subglabrous, almost continuous with the upper bracts and similar to them, half as long as the involucral scales or shorter; involucral scales uniseriate, 12, narrowly lanceolate-linear, obtuse, hispid and marked with black glandular dots along the back, $\frac{1}{3}$ in. long in flower, $\frac{3}{5}$ in. long and thickened about the base in fruit, somewhat concave by the inflection of the subscarious lateral margins; flowers yellow; achenes slender, slightly contracted towards the base, beaked at the apex, $\frac{1}{4}$ in. long including the beak, glabrous, 10-ribbed; the ribs minutely serrulate; pappus whitish, $\frac{1}{6}$ in. long, half exserted; receptacle at length naked punctulate and exposed by the reflection of the involucre.

Bumbo.—In the wooded meadows of Catumba, rather rare; fl. and fr. Dec. 1859. No. **3667**.

This is nearly related to *C. carbonaria* Schultz Bip., but the inflorescence differs.

2. **C. ephemera** Hiern, sp. n.

A glabrous erect herb, $2\frac{1}{2}$ to 3 ft. high or more; root about $\frac{1}{4}$ in. thick, firmly fleshy, elongated, apparently perennial; stems solitary or two together, rigid, rather slender, sulcate, simple below, straight or somewhat sinuous, branched above at the inflorescence; leaves mostly radical and rosulate, obovate, obtuse at the apex wedge-shaped at the sessile or subsessile almost clasping base, toothed or remotely denticulate, thinly herbaceous,

$1\frac{1}{2}$ to $2\frac{1}{2}$ in. long by $\frac{1}{4}$ to 1 in. broad; stem-leaves alternate, narrow, few, suberect; capitula campanulate in flower, hemispherical in fruit, calyculate, $\frac{1}{3}$ to $\frac{3}{8}$ in. long, about 56-flowered, on rather slender pedicels ranging up to $2\frac{1}{2}$ in. long, arranged in a wide rather lax dichotomous terminal flat-topped terminal cyme; bracts small, lanceolate or subulate; scales of the calyculus small, about 10, resembling the uppermost bracteoles; involucral scales about 20, subequal, narrowly linear-lanceolate, acute, uniseriate with sometimes an extra interior one, inserted together round the base of the receptacle, $\frac{1}{4}$ to $\frac{1}{3}$ in. long, rather thickened at the base, with scarious margins, reflected in fruit; flowers yellow; receptacle somewhat foveolate with the edges of the depressions toothed, without conspicuous scales, somewhat convex in fruit; corollas about $\frac{1}{4}$ in. long, slender, glandular-hairy about the lower part; achenes narrowly oblong, somewhat angular, glabrous, ribbed, reddish-brown, minutely muriculate, a little narrowed at the base, slightly contracted towards the truncate apex, $\frac{1}{12}$ in. long; pappus pauciseriate, slightly straw-coloured, $\frac{1}{6}$ in. long, setose; the setæ minutely scabrid.

Huilla.—In bushy pastures from Ferrão da Sola in the direction of Nene; fl. and fr. Jan. 1860. No. **3665**. In the pastures of Lopollo amongst low bushes, ephemeral; fl. and fr. Feb. 1860. No. **3666**.

3. **C. cichoriodes** Hiern, sp. n.

An erect, hispidulous, robust herb, 2 to 4 ft. high, with the habit of a *Cichorium*; root rather thick, apparently biennial or perennial; stem solitary, simple up to the inflorescence, straight, sulcate-striate, pallid and leafy at the base and on the lower part, dichotomously branched and leafless at the upper part; leaves alternate, mostly lyrate-pinnatifid, oblong or obovate-oblong, rounded and apiculate at the apex, narrowed towards the clasping often petiole-like base, thinly herbaceous, grey-green at least beneath, scattered with short hispidulous hairs on the midrib and veins, minutely aculeate-denticulate on the margin, 3 to 6 in. long by $\frac{3}{4}$ to $2\frac{1}{2}$ in. broad, the lobes obtuse, the upper leaves not lobed; capitula cylindrical, 9 or 10-flowered, homogamous, homocarpous, $\frac{3}{4}$ in. long, on unequal pedicels ranging up to $\frac{3}{4}$ in. long, arranged in a rather open corymbose terminal cyme about 6 in. in diameter; involucral bracts imbricate, pauciseriate, lanceolate or oblong, rather thin, obtuse, the outer ones hispidulous along the middle of the back, the inner ones about 12, thinner and longer, about $\frac{1}{3}$ to $\frac{2}{3}$ in. long; flowers all ligulate, the ligules whitish or slightly purplish, 5-toothed at the tip; receptacle foveolate; achenes $\frac{1}{4}$ in. long, ellipsoidal or ovoid-oblong, reddish brown, deeply sulcate, ribbed, angular, almost alate, microscopically muriculate, narrowed at the apex into a slender beak about half as long as itself; pappus pilose, $\frac{1}{4}$ to $\frac{1}{3}$ in. long, very soft, copious; the setæ pauciseriate, very slender, whitish, only microscopically barbellate.

Huilla.—In meadows between Lopollo and the lake of Ivantâla, sparingly; fl. and fr. 4 Jan. 1860. No. **3653**.

4. **C. Dumicola** Hiern, sp. n.

An erect, hispidulous, grey-green, sturdy herb, 10 to 14 in. high; root terete, $\frac{1}{4}$ in. thick, apparently biennial or perennial; stem solitary, straight or slightly sinuous, striate, simple or bipartite, somewhat leafy; lower leaves rosulate, obovate not or scarcely lobed, doubly denticulate, rounded or apiculate at the apex, wedge-shaped to the petioliform clasping base, 2 to $3\frac{1}{2}$ in. long by $\frac{5}{8}$ to $1\frac{1}{2}$ in. broad, the toothlets shortly aculeiform; stem-leaves smaller, rather few, suberect, oblong or lanceolate, sessile, clasping; capitula cylindrical-oblong in flower, campanulate in fruit, $\frac{5}{8}$ in. long, 6 to 10-flowered, on unequal scabrid pedicels ranging up to $1\frac{1}{5}$ in. long or less, arranged in a dense or rather lax narrowly oblong bracteate cyme terminating the quasi-pedunculiform stem, the lower bracts foliaceous, the upper smaller; involucral scales imbricate, pauciseriate, obtuse, from ovate to sublinear, nearly glabrous, slightly and minutely glandular on the back, thinly coriaceous, narrowly scarious on the margin, the inner ones the longest and thinnest, elongated in fruit; corollas rather exceeding the involucre; achenes ovoid-oblong, $\frac{1}{4}$ in. long, at length not compressed, obtusely angular, suboblique, deeply furrowed, ribbed, minutely wrinkled, reddish-brown (in the dry state), obtusely and obliquely narrowed at the base, contracted at the apex into a very short beak; pappus $\frac{1}{4}$ in. long, copious, whitish, somewhat spreading, setose; the setæ slender, only microscopically barbellate; receptacle foveolate.

Huilla.—In thickets on the right bank of the Lopollo stream; fl. and fr. Nov. and Dec. 1859. No. **3651.**

5. **C. ambacensis** Hiern, sp. n.

An erect perennial herb, about $2\frac{1}{2}$ ft. high; root tuberous, milky; stem purple, terete, simple up to the inflorescence, leafy and puberulous below, subglabrous and naked or nearly so about the middle, corymbosely branched at the terminal inflorescence; leaves narrowly oval-oblong, alternate, undivided, closely denticulate, apiculate at the apex, not much narrowed to the sessile more or less auriculate clasping base, glaucescent, glabrous or nearly so except along the hispid midrib, $1\frac{2}{3}$ to 3 in. long by $\frac{1}{2}$ to $\frac{3}{4}$ in. broad; capitula 10- or 11-flowered, campanulate-oblong, $\frac{1}{2}$ to $\frac{2}{3}$ in. long, glabrous, on short unequal puberulous pedicels, arranged in a rather lax terminal cyme 4 to 5 in. in diameter; involucral scales pluriseriate, imbricate; the inner ones linear-lanceolate, obtuse, about $\frac{1}{2}$ in. long, 8, biseriate, glabrous or nearly so, somewhat thickened at the base; the outer scales shorter; flowers blue, about $\frac{1}{2}$ in. long; achenes $\frac{2}{5}$ in. long including the pappus, or $\frac{5}{16}$ in. excluding the pappus, subfusiform, often obliquely so, scarcely at all compressed, longitudinally ribbed, attenuate at the apex into a short beak of $\frac{1}{12}$ in. long, nearly glabrous or minutely hispidulous; pappus whitish, slightly coloured, copious, setose, the setæ minutely barbellate.

Ambaca.—In thickets on a clay soil near Puri Cacarambola, sparingly; fl. and fr. Oct. 1856. No. **3663.**

79. **LACTUCA** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. p. 524.

1. **L. gorœensis** Schultz Bip. in Flora xxv. p. 422 (21 July 1842); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 452.

Sonchus gorœnsis Lam. Encyl. Méth. iii. p. 397 (1789); non Less. *Launœa gorœensis* O. Hoffm. in Engl. & Prantl, Nat. Pflanzenfam. iv. 5, p. 370 (1894).

Loanda.—An annual erect herb; radical leaves rosulate, variously shaped; stem sometimes only 7 in. high and sparingly branched, sometimes 2 to 3 ft. high and very much branched; flowers yellow, like lettuce. The whole plant is eaten by the negroes, and the leaves are prepared and eaten by the colonists after the fashion of lettuce. In places neglected after cultivation and at the sandy margins of dried-up streams, plentiful; Quicuxe; fl. and fr. 7 Feb. 1859, got in company with Governor Amaral. Colonial name "Serralhas" (milk lettuce). No. **3629**. An annual or biennial erect herb, simple or sparingly branched, milky, with the habit of this genus or of *Sonchus*; stem smooth, glaucescent; leaves variable, membranous, quickly withering; ligules of the florets pale yellow, flesh-coloured-purplish outside. It is used like endive as a salad and Welwitsch pronounced it very relishing. In rather dry and in moist places among low bushes throughout the district, not uncommon; between the two Maiangas; fl. and fr. Feb. 1858. No. **3630**. At Loanda; fl. and fr. May 1854. No. **3631**.

Cape de Verde Islands.—Along the rocks at the shore near Villa da Praya, in the island of San Thiago, tolerably plentiful, but mostly past flowering; fl. and fr. Jan. 1861. Our specimens much resemble *Lactuca nudicaulis* Murr. in Nov. Comment. Gotting. iii. p. 74, t. 4 (1773), but the achenes differ in having a very short beak. No. **3652**.

2. **L. petrensis** Hiern, sp. n.

An erect subglaucescent perennial herb, 9 to 15 in. high or more; rootstock rather thickened and almost woody; stems sulcate-striate, glabrate or puberulous above with short simple hairs, leafy throughout; leaves alternate, oval-oblong, acute at the apex, broad or somewhat narrowed at the sessile or subsessile clasping base, thinly herbaceous, denticulate and sometimes with a few short spreading lateral lobes, scattered on both faces with minute glandular adpressed scales, hispid with rather long and fleshy simple hairs along the midrib, otherwise glabrous, 2 to 3 in. long by $\frac{1}{2}$ to 1 in. broad; the teeth spreading, unequal, acute, often prickly; capitula broadly campanulate, many-flowered, about $\frac{3}{4}$ in. long or rather more, on rather substantial pedicels ranging up to 2 in. long, arranged in flat-topped rather dense bracteate terminal somewhat leafy cymes $1\frac{1}{2}$ to 2 in. broad; bracts intermediate in form and size as well as position between the ordinary leaves and the involucral bracts, sessile, clasping; involucral scales imbricate, pluriseriate, mostly subacute at the apex, not thickened at the base, the outermost ones broadly ovate often obtuse, the inner ones successively longer and more oblong, the innermost ones linear-lanceolate or sublinear subobtuse $\frac{5}{8}$ in. long, all partly clothed with minute glandular adpressed scales on the back, thinly coriaceous with thinner coloured or scarious margins; flowers

yellow; young achenes all alike, much compressed, elliptic-oblong, somewhat narrowed at the base, narrowed at the apex into a short beak, glabrous, with a central and sublateral rib on each side, $\frac{1}{3}$ in. long; pappus copious, $\frac{1}{3}$ in. long, setose, whitish, unequal; the setæ minutely scabrid, the outermost ones very short; receptacle without conspicuous scales.

Huilla.—In hilly rocky places near Mumpulla, towards Nene; fl. Oct. 1859. No. **3655**. At Lopollo; fl. and young fr. Jan. 1860. No. **3654**.

This is nearly related to the next species.

3. **L. imbricata** Hiern, sp. n.

A robust very nearly glabrous glaucescent herb, strictly erect, 4 to 6 ft. high; stem and branches sulcate-striate, fistular; stem-leaves alternate, pinnati-partite, rigidly membranous, acute, 6 to 8 in. long, the terminal lobe narrowly linear-lanceolate 4 to 5 in. long, the uppermost pair of the lateral lobes erect-patent similar, $1\frac{1}{4}$ to $2\frac{1}{2}$ in. long, all or most of the other lateral lobes much shorter patent obtuse acute or acutely dentiform; capitula campanulate, many-flowered, nearly an inch long, on pedicels ranging up to $1\frac{1}{4}$ in. long, arranged in rather lax, dichotomous, corymbose or obovoid cymes; involucral scales imbricate, pluriseriate, obtuse, not thickened at the base, the outermost ones short and very broad, the inner ones successively longer and more oblong, the innermost ones sublinear, $\frac{5}{6}$ in. long, all covered at least on the exposed part of the back with groups of minute very glandular specks arranged in intricate closely-figured series, coriaceous with the margins thinner and coloured or scarious; flowers yellow; the corollas rather exceeding the involucre; achenes all alike, compressed, dark reddish, ovate-oblong, $\frac{1}{4}$ to $\frac{5}{16}$ in. long or at length shorter and blunter, obtusely narrowed at the base, attenuate at the apex into the short beak, glabrous, surrounded with a thickened border and with a rib along the centre of each side; pappus $\frac{3}{8}$ to $\frac{2}{5}$ in. long, whitish but rather drab, copious, deciduous together, setose, the setæ (except microscopically) smooth; receptacle naked or without conspicuous scales.

Huilla.—In thickets at the outskirts of the Monino forests; fl. and fr. Dec. 1859. No. **3656**.

The imbricate involucre in this plant suggests *Troximon* or *Reichardia* rather than *Lactuca*; the ribs on the fruit place it near to *L. Schweinfurthii* O. & H.

4. **L. Macroseris** Hiern, sp. n.

An erect subglabrous subglaucescent robust herb, 7 to 9 ft. high, with the habit of a *Sonchus*, milky in all parts, perennial; root thick, succulent, oblique; stem solitary, terete, striate, straight, simple, widely fistular, purple throughout, almost an inch in diameter at the base, more or less leafy throughout; leaves alternate, pinnatifid, the lower ones deeply so, the upper ones scarcely lobed, denticulate, apiculate, thinly herbaceous, rather paler and aculeate-hispidulous along the midrib beneath, abruptly narrowed into a quasi-petiolate auriculate-clasping base or the

upper ones broad and auriculate at the sessile base, ranging to a foot long by 4 in. broad, the lower ones the largest, the uppermost ones small; the lobes ovate, the terminal one the largest; capitula oblong in flower, campanulate in fruit, about $\frac{3}{8}$ in. long, very numerous, 10- or 11-flowered, on short pedicels, arranged in dense oblong thyrsoid bracteate and bracteolate somewhat puberulous cymes which are quasi-pedunculate and terminate the stem; bracts like the uppermost leaves but smaller; bracteoles very small, ovate, acute, sessile; involucral scales purple, imbricate, pauciseriate, ovate or ovate-oblong or oblong-obtuse; the innermost the longest, 10, about $\frac{1}{4}$ in. long, thinly coriaceous with thinner subscarious margins, minutely glandular-puberulous on the back, glabrous and shining inside; flowers all hermaphrodite, ligulate, shortly exceeding the involucre; the ligules milk-white, rather concave, longitudinally plicate, 5-toothed at the tip, subpatent at the time of the open flower; anther-tube purplish; stigmas recurved, pubescent, violet-purple; achenes oblong or oval-oblong, rather compressed, orange-coloured, marked with about 5 longitudinal raised delicately muriculate ribs and intermediate furrows on each face, $\frac{1}{6}$ in. long, obtusely narrowed towards both ends, abruptly contracted at the denticulate truncate apex into a very short slender beak or stalk crowned with the snow-white setaceous copious pauciseriate pappus which is about the same length as the achene; receptacle somewhat foveolate.

Golungo Alto.—In Sobato Quilombo; fl. Feb. 1855. No. **3659**. In open bushy places in Sobato Quilombo; fl. and fr. Sept. 1855. No. **3658**.

Pungo Andongo.—In the rocky thickets of Catete, in the præsidium, sporadic; fl. and fr. middle of Jan. 1857. No. **3660**.

This plant was regarded by Welwitsch as a new generic type.

5. **L. capensis** Thunb. Prodr. Pl. Cap. p. 139 (1800); O. & H., *l.c.*, p. 452.

Golungo Alto.—A herb; root biennial, fleshy; stem 1½ to 3 ft. high, virgately branched; flowers from whitish to yellowish. Near Sange; fl. and fr. Dec. 1855. No. **3633**.

6. **L. abyssinica** Fresen. in Mus. Senckenb. iii. p. 72 (1839); O. & H., *l.c.*, p. 453.

Golungo Alto.—A glaucescent herb, branched from the base; ligule of the ray-florets flat, milkwhite, equally 5-toothed at the apex, spreading, quickly disappearing; disk-florets few, erect; stigmas exserted, curved inwards. In bushy rather dry situations in the road near Mussengue; fl. and fr. 6 Oct. 1855. No. **3625**. Rhizome tuberous, perennial; stem ascending, milky; florets whitish within, rosy or sordid-purplish outside; fl. and fr. beginning of Nov. 1855. No. **3626**. A subglaucous herb, 3 to 4 ft. high; flowers pendulous, clear-white, producing from afar the effect of a species of an *Anthericum* or of an *Arthropodium*. At the outskirts of thickets along the road leading towards Menha-Lula, sparingly; fl. and fr. 23 July 1855. No. **3627**. A milky glaucous herb, with thick rootstock, erect or ascending, 2 to 3 ft. high or more; ligules 5 to 7, obovate-spathulate, white, occasionally with a rosy tint, spreading at the time

of the flower. In bushy rather dry places near Sange ; fl. and fr. August 1856. No. **3628**. In wooded places at the borders of thickets in Sobato Quilombo ; fl. and fr. Sept. 1855. No. **3637**.

This species is very closely related to *L. capensis* Thunb., and has been united with it by some authors.

7. **L. andongensis** Hiern, sp. n.

An erect branched herb, $1\frac{1}{2}$ ft. high, apparently biennial, glabrous or nearly so; stem reddish; lower leaves oblong, undivided, denticulate, obtuse, sessile, scarcely narrowed at the base, 1 to $1\frac{1}{2}$ in. long; fruiting capitula campanulate, nearly an inch long, on unequal pedicels ranging up to $2\frac{1}{2}$ in. long, arranged in a rather lax oblong terminal cyme; involucral scales pluriseriate, imbricate; the inner ones about 12 in 2 or 3 rows linear-lanceolate, acute, about $\frac{3}{4}$ in. long, glabrous or nearly so; the outer ones shorter, more deltoid, minutely pruinose-pulverulent on the back; achenes $\frac{7}{8}$ in. long including the pappus or half as long excluding the pappus, narrowly elliptical, attenuate towards the apex into a beak nearly as long as the body of the achene, somewhat compressed, more or less scattered with very short hairs, marked on each side with one principal and two slighter nerves; pappus whitish, $\frac{3}{8}$ in. long, copious, setose, the setæ scaberulous.

Pungo Andongo.—In bushy places on a sandy clay soil, near Luxilla ; fr. ; only one specimen, Jan. 1857. No. **3657**.

80. **SONCHUS** Tournef., L.: Benth. & Hook. f. Gen. Pl. ii. p. 528.

1. **S. oleraceus** L. Sp. Pl., edit. 1, p. 794 (1753); O. & H. in Oliv. Fl. Trop. Afr. iii. p. 457.

Loanda.—In cultivated plots near Loanda, at Esquina de Bungo rather rare ; fl. and fr. May 1854. No. **3641**.

Golungo Alto.—An annual glaucous herb; stem strictly erect, rather rigid as well as the leaves; flowers pale yellow. In damp grassy places on the left bank of the stream Quiapoze, roadway near Menha-Lula ; fl. and fr. Jan. 1854. No. **3639**. A much-branched annual herb, 3 to 5 ft. high, usually beset (as in Europe) with pertinacious white mucor-like patches on the leaves; achenes transversely rugulose on the ribs and interspaces. Almost everywhere in cultivated and rich waste places, perhaps originally introduced with seeds from Europe; in the court of the residency, July 1855. No. **3642**. Achenes transversely rugulose. In moist warm places near Camilungo ; fr. May 1856. No. **3643**. Both in cultivated and in uncultivated places near the dwellings of the negroes, at Bango ; fr. April 1855. No. **3644**.

Var. **asper** L., *l.c.*

S. asper Hill, Herb. Brit. p. 47, c. fig. (1769).

Golungo Alto.—A glaucescent rather rigid rough herb, 2 to 5 ft. high ; stem acutely alate-angular with the decurrent keels of the leaves, towards the base as well as the leaves reddish or purple, on the upper part nearly bare and obtusely angular with the angles obsolete or but little prominent ; flowers sulphur-yellow ; ligules tridentate, sordid-red or brick-red beneath ; receptacle foveolate, with a small

hemispherical elevation, on which the achene is seated, in each depression. In marshy beds of reeds and reed-maces on the right bank of the river Cuango and at the banks of the stream Quiapoze, plentiful, flowering from October to January; Varzea do Isidro, fl. and fr. 20 Oct. 1855. The achenes are longitudinally ribbed, but not transversely rugulose. No. **3640**.

2. **S. Schweinfurthii** O. & H. in Oliv. Fl. Trop. Afr. iii. p. 458.

Golungo Alto.—A glaucescent, erect or decumbent herb, 3 to 4 ft. high; foliage variable. In damp palm-groves near Bango; fr. May 1856. Capitula subsolitary. No. **3645**. In similar situations in Sobato de Bumba; fl. and fr. Oct. 1855. No. **3646**. An elegant herb, 3 to 4 ft. high or more; flowers pale yellow. In palm-groves near Bango Aquitamba; fl. July 1856. No. **3647**. No notes; fr. No. **3643**.

Var. **violaceus**. Flowers bluish-purple or violet-coloured.

Huilla.—A herb 4 to 6 ft. high. In moist herbaceous places, not far from the river Quipumpunhime, plentiful but nearly all the specimens damaged by flood; fl. and fr. Jan. 1860. No. **3649**.

3. **S. Fischeri** O. Hoffm. in. Engl. Pfl. Ost.-Afr., C, p. 421 (1895).
Lactuca Welwitschii Elliot in Journ. Linn. Soc. xxix. p. 30 (1891).

Pungo Andongo.—An annual, very milky herb, with the habit of a *Lactuca*; florets yellowish. In the gravelly beds of a dried-up stream in the præsidium near Catete, sparingly; fl. and fr. April 1857. No. **3661**. An annual herb, root swelling, milky, very bitter; scapes 2 ft. high, not uncommonly turning purple as also do the obovate or oblong radical leaves; florets sulphur-yellow; achenes compressed, ribbed, the ribs not transversely rugose. In a sandy bushy part of the open forest between the præsidium and Luxillo, plentiful but seen only in one spot; fl. and fr. beginning of May 1857. The scapes are either solitary or in pairs. No. **3662**.

I have not seen the type of O. Hoffman's species, which was founded on a plant from Usula-Usiha in Massailand. Elliot describes, *l.c.*, this species as perennial, and includes under it a plant of his own gathering from Fort Dauphin in Madagascar. The following Nos. should be compared with this species:—

Golungo Alto.—A herb, 6 to 12 in. high; root thick, milky, perennial; leaves radical, glaucescent, rosulate; flowers whitish. In hilly rather dry sunny places between Trombeta and Cambondo; fl. and fr. Sept. 1854. No. **3632**.

Ambaca.—A herb, apparently perennial, but flowering in its first year; root branched, cylindrical, vertical, several-headed; radical leaves obovate, rosulate; stems erect, much branched, sparingly and only at the base leafy; flowers yellowish. In bushy pastures between Hâlo and Zambe; fl. and fr. Oct. 1856. No. **3634**.

Huilla.—Flowers yellowish. In varzeas (meadows) along the banks of the Lopollo stream, plentiful but very quickly disappearing; fl. and fr. Dec. 1859. No. **3664**.

4. **S. Elliotianus**.

Dianthoseris sp., Scott Elliot in Journ. Linn. Soc. xxx. p. 84 (1894). *Lactuca nana* Baker in Kew Bull. 1895, p. 17. Cf. *S. nanus* O. Hoffm. in Engl. Pfl. Ost-Afr., C, p. 421 (1895); non Sond. (1865).

Ambaca.—A perennial herb, 1½ to 3 in. high; rhizome 1 to 2 in. thick, milky, densely shaggy tomentose at its crown, many-headed;

leaves lanceolate-spathulate, ½ to 2½ in. long, developed after the flowers; flowers yellow, appearing at the beginning of spring in September and October; achenes narrow, truncate at both ends, about 5-ribbed on each face; pappus white, setæ smooth. On bushy slopes near Hâlo on the left bank of the river Lucala; fl. and fr. Oct. 1856. No. **3635**. A herb; root thick, cylindrical, milky, many-headed; young leaves lanceolate, subrepand, glaucous-green; flowers lettuce-like, yellow, precocious, fugacious. In thickets at Hâlo, plentiful, after the burnings; fl. and young fr. 8 June 1857. No. **3636**.

I have not seen O. Hoffman's type; our specimens differ in having fewer florets (13 or 14) in the capitula, and the inner involucral scales are 8 only.

The following No., represented by a bad specimen, the young flowers of which had been attacked by an insect, perhaps belongs here:—

Huilla.—Leaves radical, 1 to 1⅔ in. long; scape branched, 3 in. high; involucral scales 5. In pastures near Mumpulla, not found again subsequently; fl. Oct. 1859. No. **3650**.

The following No. was referred to *Sonchus* by Welwitsch, but I have been unable to match it with any known species, and the specimen is too young to warrant its publication as new:—

Mossamedes.—An annual milky herb, acaulescent; leaves radical, rosulate, about 4 in. long, runcinate, denticulate with small prickle-pointed teeth; inflorescence shorter than the leaves; capitula about ½ in. long; flowers yellow. About the mouth of the river Bero, abundant; young fl. July 1859. No. **3638**.

LXXII. GOODENIACEÆ.

1. **SCÆVOLA** L. (1771); Benth. & Hook. f. Gen. Pl. ii. 539 (1876). *Lobelia* Plum. ex L. (1737); L. Sp. Pl., edit. 1, p. 929 (partly) (1753); Adans. Fam. Pl. ii. p. 157 (1763).

I have not followed those botanists who substitute the name *Lobelia* for *Scævola*. In the first edition of the *Species Plantarum*, Linnæus evidently did not consider this to be the typical form of the genus which he there called *Lobelia*; he enumerated 25 species which are now considered to belong to 7 different genera, but 17 of these species are still retained in the genus usually called *Lobelia*, and only one belongs to *Scævola*.

1. **S. Lobelia** Murr. Syst. Veg., edit. 13, p. 178 (1774), excl. syn. Rumph.; Hiern in Oliv. Fl. Trop. Afr. iii. p. 462.

S. senegalensis Presl, Rel. Haenk. ii. p. 59 (1835); Welw. in Bol. Conselho Ultramar. No. 7, p. 82 (Aug. 1854), and Apont. p. 548 under n. 85 (1859).

Ambriz.—A shrub, 3 to 4 ft. high; branches distichous; leaves fleshy, very thick; flowers yellow; berries black. In sandy places along the sea-coast, near Ponta d'Ambriz, plentiful; fl. and fr. Nov. 1853. No. **1137***b*.

Loanda.—A decumbent or ascending shrub, 2 to 3 ft. high; stems usually purplish, with a juicy wood; leaves fleshy, bright green-glaucescent, rather rigid; the axils of the leaves and bracts bearded;

calyx very shortly 5-toothed or in some flowers scarcely at all dentate; corolla yellow; drupe globose, yellowish-brown when ripe. In sandy maritime parts of the island of Loanda, in company with *Halimum Portulacastrum*, var. *crithmoides*, very abundant; fl. and fr. Feb. 1854. Also at Cape Palmerinha, Dec. 1853. No. **1137**.

Mossamedes.—A decumbent, fleshy herb, 2 to 3 ft. high; bark dark green; leaves rather thick, herbaceous-greenish; flowers yellow; drupes black-bluish, juicy. In sandy maritime places between Mossamedes and Praia da Amelia, plentiful; fl. and fr. end of July 1859. Also near Girahl, July 1859. No. **1136**.

LXXIII. CAMPANULACEÆ.

All the species occurring in the district of Pungo Andongo are insignificant herbs and scarcely or not at all conspicuous among other plants; such is also the case with most of them in Huilla, but *Lightfootia collomioides* is conspicuous in meadows, while *L. tenuifolia* forms an exceedingly pretty heathlike undershrub. Only one of the Huilla species was found to occur also in Pungo Andongo, and that one, namely *L. marginata*, is very closely related to the Pungo Andongo *L. napiformis*, and perhaps might be considered too near for specific distinction. Since, however, the plants are mostly small and rapidly shrivel up, it is quite possible that some of the Huilla species may have escaped notice, since Welwitsch was shut up in the fortress during March and April 1860, and was only on rare occasions able to make botanical excursions.

1. **LOBELIA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 551; non Plum.

1. **L. thermalis** Thunb. Prodr. Pl. Cap. p. 40 (1794).

Parastranthus thermalis Alph. DC. in DC. Prodr. vii. p. 354 (1839); Sond. in Harv. & Sond. Fl. Cap. iii. p. 537 (1865). *L. leptocarpa* Griessel. in Linnæa v. p. 419 (1830); Alph. DC., *l.c.*, p. 358.

Mossamedes.—A bright green, creeping herb, with sarmentose stems, rather fleshy and rather rigid leaves, and deep blue, labiate flowers. At the sides of rivulets in the brackish parts of Os Cazados, to the east of the town, not abundant; with a few fl. July 1859. No. **5813**.

2. **L. gracillima** Welw. ms. in herb.

A very slender, annual herb, about 4 in. high; leaves radical, rosulate, oval-obovate, rounded at the apex, wedge-shaped at the base into the petiole, obtusely and remotely denticulate-repand or repand-subentire, subglabrate above, more or less scattered with long whitish hairs beneath, about $\frac{1}{6}$ in. long; petiole $\frac{1}{8}$ in. long, flattened and somewhat clasping at the base; stem scapiform, terete, inconspicuously puberulous, solitary, erect, thin, simple below, loosely divided above, few-flowered; pedicels unequal, the lowest one the longest nearly an inch long; bracts small, sublinear, inserted at the base of the pedicels; flowers nearly $\frac{1}{3}$ in. long, deep blue; calyx $\frac{1}{6}$ in. long, glabrous or nearly so, the tube campanulate, somewhat narrowed towards the base, as long as the lanceolate lobes; corolla bilabiate, the lobes of the larger lip

connate about twice as far as the length of the calyx-lobes; anthers glabrous on the back, two of them bearded at the tip, rather exceeding the undivided portion of the larger corolla-lip.

Huilla.—In damp sandy pastures on the Humpata plateau, very rare; fl. April 1860. No. **1140.**

This is perhaps nearly related to *L. inconspicua* A. Rich., the type of which I have not seen, but it appears distinct by the scapelike stem, etc. The root, though apparently annual, is possibly not really so and may be similar to that of *L. pusilla*.

3. **L. pusilla** Welw. ms. in herb.

A slender, dwarf herb, about 2 in. high; root seemingly annual, but perhaps persisting longer than a year after the fashion of some species of *Drosera*; leaves radical, rosulate, broadly oval or obovate-oval, rounded at the apex, somewhat narrowed at the base to the short or very short petiole, denticulate-repand, subglabrous above, more or less pubescent beneath with long whitish hairs, $\frac{1}{8}$ to $\frac{1}{4}$ in. long; stems scapiform, terete, geminate or solitary, puberulous, erect, simple below, usually once divided above, 2- or 1-flowered, usually sparingly bracteate; pedicels $\frac{3}{8}$ to $\frac{5}{6}$ in. long; bracts small, few, alternate or subopposite, obtuse, inserted on the stem or its forking or on the pedicels, puberulous; flowers nearly $\frac{1}{3}$ in. long, deep blue; calyx minutely puberulous, campanulate and $\frac{1}{8}$ in. long in flower, more oblong and $\frac{1}{5}$ to $\frac{1}{4}$ in. long in fruit, somewhat narrowed towards the base especially in fruit; the lobes lanceolate, acute, about $\frac{1}{12}$ in. long or rather shorter; corolla bilabiate, the lobes of the larger lip connate more than twice the length of the calyx-lobes; anther-tube somewhat pilose on the back, about equalling the undivided portion of the larger corolla-lip; two of the anthers bearded at the tip.

Huilla.—In swampy sandy willow-beds, on the left bank of the river Quipumpunhime, between Mumpulla and Nene, sparingly; fl. and fr. Oct. 1859. No. **1139.**

This is very nearly related to *L. gracillima* Welw., but differs by subsessile leaves, inflorescence, etc.

4. **L. benguellensis** Hiern, sp. nov.

A herb, 4 to 5 in. high; rootstock apparently perennial; stem abbreviated, terete, somewhat branched, shortly pubescent; leaves subradical, obovate-oval, rounded at the apex, wedge-shaped towards the base into the petiole which is about half as long, obtusely paucidentate or repand, thinly scattered with whitish pilose hairs on both faces, $\frac{1}{3}$ to $\frac{2}{5}$ in. long; inflorescence 3- to 7-flowered, terminal or quasi-terminal, glabrous or nearly so; pedicels slender, unequal, ranging up to $\frac{3}{8}$ in. long, erect or suberect, bracteolate at the base; common peduncle scapiform, $2\frac{1}{2}$ in. long, erect or ascending, sub-tribracteate: bracts alternate, sublinear, $\frac{1}{8}$ to $\frac{1}{4}$ in. long; bracteoles similar, smaller; flowers about $\frac{1}{3}$ in. long, apparently blue; calyx campanulate and $\frac{1}{10}$ to $\frac{1}{8}$ in. long in flower, ovoid and $\frac{3}{16}$ in. long in fruit, glabrous; the lobes lanceolate-linear, rather obtuse, $\frac{1}{20}$ to $\frac{1}{16}$ in. long; corolla unilabiate, shortly 5-lobed; anthers glabrous on the back, equalling the undivided

portion of the corolla, two of them bearded at the tip; seeds obtusely trigonous.

Huilla.—In somewhat spongy pastures with short herbage, near Mumpulla towards Nene, in company with *Trifolium subrotundum* Steud., var. *obcordatum* Welw., not abundant; fl. and fr. Oct. 1859. No. **1144**.

5. **L. Welwitschii** Engl. & Diels in Bot. Jahrb. xxvi. p. 116 (Sept. 27, 1898).

A glabrous herb, 5 to 8 in. high; root perennial; rhizome creeping, branched; stems usually numerous, simple, erect or ascending or the young shoots creeping, narrowly winged and leafy chiefly on the lower part; leaves alternate, obovate or the upper ones sublinear, rounded or obtusely pointed at the apex, sessile, subentire or repand-denticulate, $\frac{1}{4}$ in. long, narrowly decurrent; flowers deep azure-blue, $\frac{1}{2}$ in. long, on rather slender pedicels of $\frac{1}{4}$ to $\frac{1}{2}$ in. long, arranged in racemes of 1 to 4 in. long terminating the stems; calyx $\frac{1}{6}$ to $\frac{1}{3}$ in. long; the tube somewhat funnel-shaped; the lobes narrowly lanceolate-linear, rather acute, $\frac{1}{10}$ in. long; corolla unilabiate, with three oval-oblong lobes about as long as the tube and two narrow smaller ones; anther-tube somewhat hairy on the back, rather exceeding the undivided portion of the corolla, two anthers bearded at the tip; seeds somewhat compressed.

Huilla.—In damp sandy places along streams about Lopollo, rather rare; fl. and fr. Dec. 1859 and Jan. 1860. No. **1142**.

Var. **albiflora**.

Rhizome strong; stems less numerous, 5 in. high; flowers white.

Huilla.—In moist sandy places, drying up after the October rains, near Nene towards Empalanca, rather rare; fl. and fr. Dec. 1859. No. **1141**.

6. **L. fervens** Thunb. Fl. Cap. ii. p. 46 (1818); Hemsl. in Oliv. Fl. Trop. Afr. iii. p. 468.

Mossamedes.—An herbaceous-green, not glaucous, annual herb, flaccid throughout, subsarmentose, decumbent, or subscandent among other herbs; flowers blue. In moist sandy places with shrubs and short herbage along the banks of the river Maiombo, near Páo; fl. and fr. Oct. 1859. No. **1143**.

7. **L. angolensis** Engl. & Diels, *l.c.*, p. 114.

A glabrate or weakly pubescent, rather fleshy herb, 1 to 3 in. high, cæspitose at the base, with the habit of *Glaux*; stems decumbent or erect, not conspicuously angular, sometimes rooting below, leafy; leaves alternate, oval or somewhat obovate, obtuse, subsessile, not or scarcely decurrent, $\frac{1}{6}$ to $\frac{1}{3}$ in. long, entire; flowers axillary, solitary, $\frac{1}{4}$ in. long, violet-coloured or lilac; pedicels rather slender, $\frac{1}{4}$ to $\frac{1}{2}$ in. long; calyx $\frac{1}{8}$ in. long, thinly pubescent, broadly campanulate, deeply 5-cleft; the lobes lanceolate, about equalling the corolla-tube; anthers puberulous on the back, two of them bearded at the tip.

Huilla.—In swampy pastures with dense and short herbage near Lopollo, in company with *Trifolium subrotundum* Steud., var. *obcor-*

datum Welw. herb. n. 1901*b*, *Anagallis pumila* Sw., and species of Gentianaceæ, *Limosella*, and *Eriocaulon*, abundant; fl. Dec. 1859 and Feb. 1860. No. **1146**. Fl. Oct. 1859. No. **1146***b*.

This is nearly related to *L. exilis* Hochst.

8. **L. nuda** Hemsl. in Oliv. Fl. Trop. Afr. iii. p. 469.

Huilla.—An erect, dichotomously and virgately branched herb, ½ to 2 ft. high, flowering twice or even thrice in a year; flowers blue. In sandy sunny damp places flooded in summer near Lopollo and in neglected plots, also along streams and by the aqueduct, plentiful; fl. and fr. Oct. to Dec. 1859, and Feb. and May 1860. No. **1145**.

2. **CYPHIA** Berg.; Benth. & Hook. f. Gen. Pl. ii. p. 554.

1. **C. lobelioides** Welw. ms. in herb.

Cyphia (sp.), Welw. in Journ. Linn. Soc. v. p. 187 (June 1861).

A slender, glabrous or subglabrate, quite simple herb, with the aspect of a *Lobelia*, perennial with a globose-tuberous root of ½ in. diameter; stem filiform, straight, 1 to 1½ ft. high, angular, sparingly leafy, terminating in a raceme of flowers; leaves linear or narrowly lanceolate-linear, minutely denticulate, adpressed, ½ to 1¼ in. long, sessile; flowers violet-purple, bilabiate, ⅓ to ½ in. long; pedicels about $\frac{1}{12}$ in. long or shorter, equalling the bracteoles; racemes spikelike, 1 to 5 in. long; calyx somewhat turbinate, ⅛ to ⅓ in. long, pubescent, deeply 5-cleft; the segments linear or nearly so, erect, persistent, sparingly and minutely denticulate; corolla quasi-tubular; the tube pilose inside, opening at the back; the lobes of the limb 5, linear, ⅙ to ¼ in. long, pilose inside with white hairs, induplicate in the bud; stamens 5, hypogynous, persistent, inserted at the very base of the corolla-tube, $\frac{1}{10}$ in. long; the filaments flattened, glabrous or nearly so, about as long as the anthers, whitish; the anthers linear, all curved-converging above the stigma, and bearded at the apex, otherwise glabrous or nearly so; ovary inferior; style simple, rather thick, incurved; stigma thick, shortly indusiate, bearded with white hairs.

Huilla.—In damp wooded meadows between Lopollo and Morro de Quilengues, plentiful here and there; fl. Jan. 1860. No. **1135**.

A form with the stem branched occurs, but rarely.

3. **CEPHALOSTIGMA** A. DC.; Benth. & Hook. f. Gen. Pl. ii. p. 555.

1. **C. Schimperi** Hochst. in Plant. Schimp. Abyss. i. n. 69 (*U. i.* 1840); A. Rich. Fl. Abyss. ii. p. 2 (1851).

Wahlenbergia Schimperi Hochst., *l.c.*, iii. n. 1964 (1844). *Lightfootia arenaria* Alph. DC. in Ann. Sc. Nat., sér. 5, vi. p. 329 (1866); Hemsl. in Oliv. Fl. Trop. Afr. iii. p. 476. *C. hirsutum* Hemsl., *l.c.*, p. 472; non Edgw.

Huilla.—An annual herb; stem erect, 8 in. or scarcely a foot high, branched from the base; branches elongated; leaves rather rigid, sessile, lanceolate; flowers solitary, axillary, arranged in a paniculate manner; corolla 5-cleft, from milk-white becoming purple; the lobes narrow, spreading during the flowering; stigma 3-lobed. In sandy places neglected after cultivation, also in plantations of maize, in

company with species of *Commelina*, in the Monin ocountry ; fl. and fr. 1 May 1860. No. **1155**. Leaves broadly lanceolate vaguely undulate, entire ; flowers pentamerous, very fugacious ; corolla-lobes much narrowed from a rather broad base ; style filiform, exserted ; stigmatic lobes rather thick, subspathulate, spreading ; seeds cylindrical-ellipsoidal, bright dusky, quite glabrous, shining. In nearly dry sandy thickets and among crops of mays, near Lopollo ; fl. and fr. 8 May 1860. No. **1155***b*.

Annual. Fr. with ripe seeds, March and April 1860. Cf. COLL. CARP. 692 (partly).

2. **C. Candolleanum.**

Lightfootia paniculata A. DC., *l.c.*, 331; Hemsl., *l.c.*, 476 ; non Sond.

HUILLA.—A very slender, annual herb, scarcely a foot high ; stems several, ascending ; flowers pale blue or whitish. In drying-up swampy places throughout the district ; fl. and fr. Nov. and Dec. 1859 ; also in damp meadows along the banks of the Ferrão river, in company with orchids (probably *Satyrium paludosum* Reichenb. f. ; Welw. herb. n. 727) ; fl. Jan. 1860. No. **1153**.

The stigmatic lobes are short and broad at the apex of the filiform style. This is not the same as *C. paniculatum* Alph. DC. nor as the plant so named by Wallich.

4. **LIGHTFOOTIA** L'Hérit. ; Benth. & Hook. f. Gen. Pl. ii. p. 555.

1. **L. tenuifolia** Alph. DC. in Ann. Sc. Nat., sér. 5, vi. p. 327 (1866) ; Hemsl. in Oliv. Fl. Trop. Afr. iii. p. 475.

HUILLA.—Flowers nearly milky-white with bluish tint. In wooded pastures and on bushy slopes near the lake of Ivantâla ; fl. and fr. Feb. and beginning of April 1860. No. **1157**. Perennial ; flowers milky-blue. In bushy wooded parts of the Monino country, and also in shady forests ; fl. and fr. beginning of Feb. 1860. No. **1159**.

2. **L. marginata** Alph. DC., *l.c.*, p. 326 ; Hemsl., *l.c.*, p. 474.

HUILLA.—Flowers pale blue. In sandy pastures with short herbage, near Lopollo, Nov. 1859 ; also in hilly places among low bushes from Humpata as far as the lake Ivantâla, and along the road leading to Quilengues, abundant ; fl. and fr. Feb. and April 1860. No. **1156**. Corolla whitish-blue. In wooded meadows near Eme, Feb. 1860 ; also in herbaceous bushy places at the outskirts 'of forests between Catumba and Ohai. A shaggy form of the species. No. **1156***b* Root vertical, apparently biennial. In rocky wooded places from Catumba towards Ohai ; a few specimens ; fl. and fr. April 1860. No. **1158**.

3. **L. napiformis** Alph. DC., *l.c.*, p. 328 ; Hemsl., *l.c.*, p. 475.

PUNGO ANDONGO.—A perennial herb, 3 to 4 ft. high, with a woody rootstock, suberect or ascending ; stem virgately branched, beset almost on all sides with rather rigid hairs ; calyx herbaceous-green, the tube adnate to the base of the ovary, the limb 5-cleft ; corolla inserted on the top of the calyx-tube, of a pale violet colour, deeply 5-partite, the segments rigidly pilose ; stamens 5 ; filaments free, gradually dilated from the base, sub-trilobate, the lateral lobes very short and ciliate, the intermediate lobe larger elongated and at the apex bearing the anther ; ovary covered up to the middle by the adnate calyx, 3-celled ; ovules numerous, inserted near the bottom of the cells on the central placentas ; styles exserted, filiform from

the base, gradually thickened upwards, pubescent; stigmas 3, ovoid-oblong, rather thick, erect-patent, papillose on the inner face; capsule pyramidal when young, 3-celled, half-dehiscent at the apex. In secondary woods and rather dry thickets on the right bank of the river Cuanza, sporadic but widely scattered; fl. and young fr. 21 and 22 Jan. 1857. No. **1150**.

Alph. De Candolle, *l.c.*, cites for this species also No. 1150 *bis*; but there is no such No. in Welwitsch's herbarium.

4. **L. collomioides** Alph. DC., *l.c.*, p. 328; Hemsl., *l.c.*, p. 475.

Huilla.—Apparently biennial; habit almost of *Jasione*; root napiform, 1- or few-headed; stem 1 to 2 ft. high, branched, purplish; leaves alternate, linear or linear-lanceolate, wavy-crenate on the margin, bright green above very pallid beneath and therefore almost discolorous; flowers terminal, densely capitate, involucrate, the involucral leaves almost similar to the cauline ones; calyx green, rather fleshy, the limb 5-cleft; corolla clear blue or milky blue, 5-partite, the segments elongated; stamens 5, inserted with the corolla; filaments free, white and broadly dilated from the base up to a little below the apex, of the same colour as the corolla and narrowed at the apex; anthers free; style elongated, filiform, gradually passing into the simple clavate obtuse sub-pubescent stigma, pale bluish. In the damp elevated mountain pastures of Morro de Lopollo, at an elevation of 5600 feet; fl. 27 April 1860. No. **1163**.

5. **L. annua** Alph. DC., *l.c.*, p. 329; Hemsl., *l.c.*, p. 475.

Pungo Andongo.—An annual, erect or ascending herb, scattered throughout with rather rigid white hairs, branched from the base; branches long, virgate; flowers blue or violet-coloured; stamens 5; filaments shortly clawed at the base, abruptly deltoid-dilated, tridentate, the lateral teeth very small, the intermediate tooth blue and articulate at its base with the top of the shaggy lamina; style always pilose with spreading hairs; stigma rather clavate than capitate, usually pilose but occasionally glabrous; capsule compressed-conical, usually smooth. In the drier open sandy thickets on the south side of the præsidium, very plentiful about Caghuy; fl. and fr. beginning of April and in May 1857. No. **1147**. Flowers violet-blue; corolla-limb quite patent, almost declining-reflected; capsule ovoid-pyramidal. In the more elevated rocky places among the gigantic rocks of the præsidium; fl. and young fr. end of April 1857. No. **1147***b*. A tender, branched, annual herb, erect procumbent or ascending, in the living state pale green by reason of its whitish hispid hairs; flowers small, pale blue. In stony and sandy pastures with sparse herbage along the road leading to Cambambe; fl. May 1857. No. **1147***c*.

Huilla.—Much branched from the base, the lower branches spreading elongated, all floribund; flowers clear blue, pentamerous; anthers very large, white; filaments rhomboid-dilated at the base, whitish, blue a little below the insertion of the anthers; style filiform; stigma clavate, bilobed, the lobes cohering. In rocky pastures at the base of Morro de Lopollo, at Ferrão da Sola; fl. 14 May 1860. No. **1162**. Habit almost of *Prismatocarpus*; diffuse, somewhat pilose; flower-buds pentagonal-columnar; corolla deep blue inside, paler outside; filaments very broad at the base, ciliate; style exserted, smooth, not pilose; stigma at first club-shaped and obtuse, at length bilobed with diverging lobes. In moist wooded pastures at the base of Morro de Lopollo; fl. and fr. 8 April 1860. No. **1162***b*. Annual. Fr. March and April 1860. Cf. Coll. Carp. 692 (partly).

6. **L. gracilis** Alph. DC., *l.c.*, p. 330; Hemsl., *l.c.*, p. 476.

Huilla.—A little annual herb, 3 to 4 in. high; stem corymbosely branched towards the apex; flowers clear blue. In swampy somewhat peaty pastures near Humpata; fl. Jan. 1860. No. **1151**.

7. **L. exilis** Alph. DC., *l.c.*, p. 330; Hemsl., *l.c.*, p. 476.

Huilla.—A tender, little, annual herb, 3 to 5 in. high; stem patently branched; flowers from milky to bluish; corolla-limb patent at the time of the flower, soon flaccid-collapsing. In moist pastures on the Humpata plateau, in sandy-earthy places with short herbage, very plentiful; fl. April 1860. No. **1152**.

8. **L. debilis** Alph. DC., *l.c.*, p. 331; Hemsl., *l.c.*, p. 476.

Huilla.—Habit almost of some species of *Galium*; flowers milk-white. In moist pastures among low herbs and scattered bushes at the outskirt of the forest near Catumba; fl. beginning of April 1860. No. **1154**.

9. **L. Welwitschii** Alph. DC., *l.c.*, p. 332; Hemsl., *l.c.*, p. 477.

Pungo Andongo.—An annual herblet, with the habit of a large specimen of *Asterolinon stellatum* Hoffmansegg & Link; primary stem erect; branches elongated, ascending, weak; leaves cartilaginous on the margin; calyx exceeding the corolla, stellate-patent at the time of the flower as are also the corolla-lobes; corolla livid-yellowish; style clavate above, undivided or scarcely or obsoletely bilobed at the apex, clear blue, not bearded; capsule compressed-conical. In a damp wooded meadow between Caghuy and Sansamanda at the river Cuanza, plentiful but only in one spot, in company with *Isoetes æquinoctialis* Welw. herb. n. 50 and species of *Hypoxis* and *Fuirena*; fl. and fr. 2 May 1857. No. **1149**. In a moist rocky-sandy place near Catete in the præsidium, very sparingly; only two specimens seen, without either fl. or fr. April 1857. Apparently a form of this species. No. **1148**.

5. **CERVICINA** Delile, Fl. Egypte, p. 150 (1812), t. 5, fig. 2, & Illustr. p. 50.

Wahlenbergia Schrad. Cat. Hort. Gotting. (1814); Benth. & Hook. f. Gen. Pl. ii. p. 555. *Campanula* § *Campanopsis* R. Br. Prodr. p. 561 (1810).

1. **C. huillana.**

Wahlenbergia huillana Alph. DC. in Ann. Sc. Nat., sér. 5, vi. p. 333 (1866); Hemsl. in Oliv. Fl. Trop. Afr. iii. p. 479; incl. var. *pusilla* Alph. DC., *l.c.* *Campanopsis huillana* O. Kuntze, Rev. Gen. Pl. (ii.), p. 379 (1891).

Huilla.—An annual or occasionally biennial herb, with the habit of an *Alsine*, lactescent; stems several, ascending, much branched; flowers trimerous or tetramerous, from whitish to very pale bluish, the tetramerous ones shaped almost like those of an *Asperula* or *Galium*; calyx-lobes unequal; anthers distinct. In marshy wooded places from Lopollo towards the lake of Ivantàla, but met with only in a few spots; fl. Dec. 1859 and Jan. 1860. No. **1161**. Flowers whitish. In the poor elevated pastures of Empalanca, with short herbage, flooded in the rainy season, that is, in summer, abundant; fl. end of Feb. 1860. This contains the var. *pusilla* Alph. DC., which was a young plant of the species, and according to Welwitsch is not really a variety. No. **1160**.

In Apontam. p. 548 under n. 86, Welwitsch reports a species of *Wahlenbergia* from the highlands of Angola proper; this is apparently the plant collected in Ambaca in the middle of Oct. 1856 in a moist pasture on the left bank of the river Lucala near Ponte de Lucala, No. **1138**; it is a unique specimen, represented in the British Museum only by a drawing. It is impossible to identify the species; Welwitsch subsequently placed it in *Lobelia*.

LXXIV. ERICACEÆ.

1. **AGAURIA** Benth. & Hook. f. Gen. Pl. ii. p. 586.

1. **A. salicifolia** Oliv. Fl. Trop. Afr. iii. p. 483.

Var. **pyrifolia** Oliv., *l.c.*

Andromeda pyrifolia Pers. Syn. Pl. i. p. 481 (1805). *Leucothoe salicifolia*, var. *pyrifolia* DC. Prodr. vii. p. 603 (1829).

Huilla.—A small tree of 8 to 10 ft., with spare head and rambling branches. In damp forests behind the Monino river, very rare; fr., after the fall of the corolla and seeds, Feb. 1860. No. **4807**.

The absence of flowers renders the determination somewhat doubtful; the infructescence is apparently terminal.

2. **FICALHOA** Hiern in Journ. Bot. xxxvi. p. 329, t. 390 (1 Sept. 1898).

Calyx free, hemispherical, persistent, 5-partite; the segments broadly ovate, rounded at the apex, somewhat imbricate in æstivation, quincuncial, nearly unchanged in fruit; corolla short, not much exceeding the calyx, sub-urceolate, tardily deciduous, deeply 5-lobed; the lobes broadly oval, rounded at the apex, alternating with the calyx-segments, erect below, somewhat spreading at the apex, imbricate, quincuncial; stamens 15, uniseriate, free, included, glabrous, inserted on the interior of the corolla near the top of its short tube, arranged in 5 groups of 3 stamens each, the groups alternating with the corolla-lobes and having the filaments contiguous at the base; filaments rather fleshy, erect, about half as long as the corolla-lobes, tapering from a broader base; anthers short, emarginate at both ends, 2-celled, basifixed, at length dehiscing by oblique apical pores; disk inconspicuous, annular or nearly obsolete; ovary 5-celled, sub-hemispherical, obtusely pentagonal, rather fleshy, pilose, with a central depression at the apex; style short, central, glabrous; the stigma glabrous, at first ovoid-capitate and very short, at length as long as the ovary and splitting into 5 diverging branches; ovules numerous in each cell, very small, inserted on fleshy ascending placentas attached to the axis of the ovary below its middle; capsule hemispherical, 5-valved, loculicidal; the septa hardening, opposite to the persistent calyx-segments; seeds several, small, irregularly ovoid, somewhat compressed; testa of an open reticular structure; albumen rather thin; embryo rather thick, terete, about two-thirds as long as the seed, straight.

A tree, with alternate serrulate laurel-like simple leaves, and axillary or lateral densely paniculate hermaphrodite flowers.

Nearly related to *Agauria*, it differs from it by the shorter figure of its corolla, the grouping of its more numerous stamens, the toothing of its foliage, etc.

The name is given in honour of Count Ficalho, professor of botany at the Polytechnic School of Lisbon, a friend and fellow-worker on African plants.

1. **F. laurifolia** Hiern, *l.c.*

An evergreen tree, 15 to 20 ft. high or less; trunk attaining 8 in. in diameter; branches glabrous, terete, spreading, rambling; branchlets leafy, rather slender, at length nodding; leaves ex-stipulate, narrowly oval- or ovate-oblong, acuminate towards the apex, obtuse at the base, subcoriaceous, rather glossy, deep green and glabrous or in part minutely glandular-scaly above, paler and sparingly pilose chiefly along the midrib and also minutely glandular-scaly beneath, obtusely serrulate on the subcartilaginous margin, 2 to 5 in. long by $\frac{1}{2}$ to $1\frac{1}{6}$ in. broad; the midrib conspicuous, the lateral veins inconspicuous; petiole usually glabrous, $\frac{1}{8}$ to $\frac{1}{3}$ in. long; flowers $\frac{1}{8}$ to $\frac{1}{6}$ in. long, white, regular or nearly so, on short or very short puberulous or pilose rather thick pedicels, arranged in lateral or axillary contracted panicles of $\frac{3}{4}$ to $1\frac{1}{4}$ in. in diameter; bracts oval or broadly ovate, obtuse, usually ciliolate, about as large as or smaller than the calyx-segments; calyx usually bracteolate at the base; bracteoles half as long as the calyx; calyx-segments ciliolate, about $\frac{1}{8}$ in. long; corolla about $\frac{1}{8}$ in. long, glabrous; the filaments sometimes bent at the apex; style (including the stigmatic branches) at length $\frac{1}{12}$ in. long; ovary densely and shortly pilose; capsule about $\frac{1}{8}$ in. in diameter, about equalling the adpressed calyx. Occasionally the pistil is hexamerous. Seeds rather pale, about $\frac{1}{40}$ in. long; embryo whitish, about $\frac{1}{60}$ in. long.

HUILLA.—In moist forests at the Lopollo cataracts in Morro de Lopollo, sporadic; fl. and fr. Dec. 1859. No. **4808**. In thin forests between Mumpulla and Nene; fl. and fr. Oct. 1859. No. **4809**. A small tree, with a sparse, lax head. In the more elevated parts of Morro de Monino, at the banks of streams; without fl. end of March 1860. Perhaps a hirsute form of this plant. No. **4810**.

3. **PHILIPPIA** Klotzsch; Benth. & Hook. f. Gen. Pl. ii. p. 591.

1. **P. benguelensis** Welw. ex Engl. Hochgebirgsfl. p. 328 (1892), and ex Britten in Trans. Linn. Soc., Ser. 2, iv. p. 24 (1894) (*P. benguellensis*).

Salaxis benguelensis Engl., *l.c.*

HUILLA.—A shrub of 4 to 7 ft. with numerous stems from the base and the habit quite that of an *Erica* or a *Cupressus*, or occasionally in the form of a small tree, much branched; leaves 4-verticillate, rather thick, pubescent, in the living state intensely green; petiole broad; flowers purplish, axillary near the apex of the branchlets; peduncles and calyces thinly hispidulous-pubescent; calyx more or less regularly 4-dentate; one of the teeth elongated, more compact and rigid, erect or a little incurved; corolla globose, 4-lobed, rather rigidly membranous; the lobes very obtuse, delicately but plainly denticulate about the

apex ; stamens 8, subexserted, free, compressed, comparatively rather broad ; anthers adnate, ecaudate ; ovary thinly pubescent, 4-celled ; cells with several ovules ; style straight, the same height as the stamens ; stigma comparatively large, peltate, hollowed, deep red-purple, more or less papillose in the centre. In the more elevated thickets along streams in the declivities of Morro de Lopollo, at 5000 to 6000 ft. alt., not uncommon, in company with *Lycopodium cernuum* L. (Welw. herb. n. 170) and species of Melastomaceæ ; fl. middle of Dec. 1859. No. **2560.**

This shrub is called by the Portuguese colonists "Cedro pequeno" (small cedar) or "Cypreste do monte" (mountain cypress) ; in Mossamedes *Tamarix orientalis* Forsk. is called "cedro" ; see *ante* p. 35.

4. **BLÆRIA** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 592.

1. **B. Bugonii** Engl. Hochgebirgsflora, p. 327 (1892).

Huilla.—A slender shrublet, a foot high ; stems cæspitose, erect or ascending, twiggy ; twigs erect, the lower ones sterile and densely leafy, the upper ones flowering ; flowers in the living state whitish, occasionally with a rosy tint, tetramerous or rarely pentamerous, arranged in straight compound racemes interrupted in a quasi-verticillate manner ; pedicels uni-bracteate ; calyx 4-partite ; the segments linear-oblong, glandular-ciliate, equal ; corolla urceolate-campanulate, twice as long as the calyx, deeply 4-lobed ; the lobes deltoid, obtuse, erect-spreading ; stamens 4, included ; filaments free, nearly smooth ; anthers dehiscing at the apex, brown-reddish ; pores wide, elliptical ; ovary 4-celled ; cells with several ovules ; style nearly straight, a little or rather far exceeding the corolla ; stigma widely peltate, brown-reddish ; capsule loculicidally 4-valved, 4-celled ; valves bearing the septum in the middle ; seeds 3 or 4 in each cell. In an elevated boggy swamp along a stream in Morro de Lopollo towards Empalanca, at 5500 ft. alt., in masses but only in one spot and in company with species of Commelynaceæ, *Xyris* and small Cyperaceæ ; fl. and fr. April 1860. No. **2559.**

Engler, *l.c.*, has unfortunately failed to give effect to Welwitsch's intention of naming this species in honour of Senhor Bayon, an explorer of the interior parts of Angola.

2. **B. setulosa** Welw. ex Engler, *l.c.*, p. 328 ; Britten in Trans. Linn. Soc., Ser. 2, iv. p. 24 (1894).

Huilla.—A shrublet, 1 to 2 ft. high ; stems as thick as a crow's quill, cæspitose, erect or ascending, densely leafy ; leaves ternately verticillate ; flowers from whitish to rosy or more or less purplish ; calyx-lobes incise-ciliate. In the more elevated mossy swampy thickets of Serra de Oiahoia near Humpata ; fl. and young fr. end of April 1860. No. **2558.**

LXXV. PLUMBAGINEÆ.

1. **PLUMBAGO** Tournef., L.; Benth. &|Hook. f. Gen. Pl. ii. p. 627.

1. **P. zeylanica** L. Sp. Pl., edit. 1, p. 151 (1753) ; Oliv. Fl. Trop. Afr. iii. p. 486 ; Ficalho, Pl. Uteis, p. 209 (1884).

Loanda.—Stem subscandent ; flowers milk-white ; calyx very viscid. By fences near the city at Museque do Senhor Schut, sporadic ; fl. Dec. 1853. A medicinal plant. No. **518***b*.

Libongo.—An erect shrub or rarely in thickets subscandent, 2 to 3½ ft. high ; branches pale purplish ; flowers whitish. In rather dry bushy places about Banza de Libongo, in company with tamarind trees, very plentiful ; fl. and fr. Sept. 1858. No. **518.**

Golungo Alto.—An undershrub, 2 to 4 ft. high, sometimes erect, occasionally scandent ; flowers milk-white. In thickets near Cangueras-sange and in Sobatos Bango and Bumba, not abundant although seen in many places ; fl. and fr. Nov. 1854 and April 1855. No. **517.**

Huilla.—In thickets between Nene and Humpata, sporadic ; fl. and young fr. Dec. 1859. No. **516.**

The natives of Angola call this plant "Cadinga puna" and use the root as a caustic. See Welwitsch, Apontam. p. 548 under n. 83.

2. **VOGELIA** Lam. (1792) ; Benth. & Hook. f. Gen. Pl. ii. p. 628 ; non Medic.

1. **V. africana** Lam. Tabl. Encycl. et Méth., Bot., ii. p. 149, t. 149 (July or Aug. 1792) ; Boiss. in DC. Prodr. xii. p. 696 (1848).

Dyerophytum africanum O. Kuntze, Rev. Gen. Pl. (ii.), p. 394 (1891). *Vogelia* (sp.), Welw. in Journ. Linn. Soc. v. p. 184 (1861).

Mossamedes.—A low shrub, 2 ft. high ; stem glaucous ; branches numerous, very brittle, divaricate ; leaves spathulate, rather fleshy and flaccid, glaucous ; calyx whitish, the segments ovate, transversely rugose, with a black midrib ; corolla tubular, brilliantly vermilion ; ovary acutely conical ; ovule solitary, quite freely pendulous from the ascending filiform placenta. In a sandy sub-maritime place between Mossamedes and Cavalheiros, abundant, but seen in only one spot ; end of June 1859, most of the corollas having fallen. No. **519.** A very elegant undershrub, 1½ ft. high, woody at the base ; leaves spathulate, glaucous-pruinose ; flowers blood-red ; calyx white-greenish. In sandy places at the river Bero ; late fl. and fr. July 1859, in company with *Zygophyllum simplex* L. ; (see *ante*, p. 106.) Coll. Carp. 95.

The specimens differ from the plant figured under this name by Harvey, Thes. Cap. ii. t. 198 (1863) by their leaves being neither emarginate at the apex nor obcordate but obovate spathulate and rounded and abruptly acuminate at the apex, by their ovate-lanceolate long-acuminate not subulate bracts, and by their corolla-tube much exceeding the calyx.

O. Kuntze, *l.c.*, i. p. 37, uses the name *Vogelia* Medic., which he states was published a few months earlier than the above, for *Neslia* Desv. The correct name for the latter genus is, however, *Sphærocarpus* Heist. ex Fabric. Enum. Meth. Pl. Hort. Helmst., edit. 2, p. 51 (1763), the authority for which is not affected by Seguier having in 1745 applied such a name for a different plant. *Vogelia* Gmel. (1791) has been reduced to *Burmannia* L.

LXXVI. PRIMULACEÆ.

1. **ANAGALLIS** Tournef., L. ; Benth. & Hook. f. Gen. Pl. ii. p. 637.

1. **A. pulchella** Welw. ex Schinz in Bull. Herb. Boiss. ii. p. 221 (March 1894).

Huilla.—An erect, very beautiful herb, annual or rarely biennial, rather fleshy throughout, stems numerous ; flowers bright purple-rosy ;

capsule circumsciss. In swampy pastures with short herbage along the banks of the Monino river, very plentiful, in company with species of *Drosera*, Gentianeæ, *Pæpalanthus Wahlbergii* Körn. (Welw. herb. n. 2455), *Xyris*, and *Ascolepis*; fl. and fr. Nov. and Dec. 1859. No. **276**. In wooded swampy meadows at the banks of the Eme rivulet near Lopollo; fl. and fr. end of Dec. 1859. A small form. No. **276***b*. In swamps along the Eme rivulet; fl. Dec. 1859. A dwarf and narrow-leaved form. No. **276***c*. A cæspitose, very shining herb, 3 to 6 in. high, perhaps annual; flowers very numerous, rosy-red. In damp and marshy pastures near the Monino; fl. from Jan. to March; fr. Coll. Carp. 693.

2. **A. acuminata** Welw. ex Schinz, *l.c.*

Huilla.—A dwarf, erect, annual herb; stems rather fleshy, turning red; leaves strictly erect; flowers whitish; calyx-lobes acuminate-subulate, rather fleshy; corolla longer than the calyx, with acutely acuminate lobes; capsule turning red. In damp sandy wooded places from Morro de Lopollo towards Empalanca, at an elevation of about 5300 ft., rather sparingly; fl. and fr. 13 April 1860. No. **275**. This plant has much the habit of *Centunculus*.

3. **A. pumila** Swartz, Prodr. Veg. Ind. Occ. p. 40 (1788); Benth. Fl. Austral. iv. p. 270 (1869).

Centunculus pentandrus Br. Prodr. p. 427 (1810). *C. tenellus* Duby in DC. Prodr. viii. p. 72 (1844). *Micropyxis pumila* Duby, *l.c.*; Alph. DC. Geogr. Bot. p. 1035 (1855).

Pungo Andongo.—An annual, marsh herblet, 3 to 5 in. high; stem filiform, reddish at the base, quadrangular; leaves opposite, ovate, sessile, thinly rather fleshy, lepidote-papillose; calyx deeply 5-partite, green; corolla white, rather fleshy, but little or scarcely longer than the calyx, very deeply 5-partite; the segments almost separate, ovate; stamens 5, equal in length to the corolla-segments and opposite to them; filaments filiform, at the base dilated-bearded, almost connate into a cylinder; anthers ovoid, 2-celled, longitudinally dehiscing, yellowish; ovary globose, received at the base on a waxy orange-coloured disk-like mass, marked with a circular horizontal line, 1-celled; placenta globose, basilar, many-seeded; style filiform, equalling the stamens; stigma rather obtuse; capsule circumsciss. In a wooded wet shortly grassy meadow, in masses but seen only in one spot, in company with *Drosera* and *Isoëtes*, near Sansamanda on the left bank of the river Cuanza, fl. 22 Feb. 1857. No. **273**. In marshy meadows between Condo and Quisonde; fl. and fr. March 1857. No. **273***b*.

Huilla.—A slender annual erect herb, a digit high; stem angular, mostly purple; branches and leaves alternate; flowers white; calyx 5-partite; the segments ovate, acuminate; corolla a little longer than the calyx, urceolate; the tube globose, clothed around inside at the base with a scarlet viscid material of a glandular nature; the limb 5-cleft, with ovate-lanceolate acuminate lobes; stamens 5, included; filaments not bearded at the base; ovary globose; style straight, simple, stigma peltate. In meadows or damp pastures, in the elevated parts of Morro de Monino, plentiful, about 5300 ft. of altitude, in company with species of *Utricularia*, *Xyris*, *Ascolepis*, etc.; fr. and few fl. beginning of April 1860. No. **274**.

The habit is much like that of *Centunculus*, and the characters scarcely differ.

2. **SAMOLUS** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. p. 638.

1. **S. Valerandi** L. Sp. Pl., edit. 1, p. 171 (1753); Oliv., *l.c.*, 490.

Loanda.—On rocks and damp walls, between Praia de Penedo and Boa Vista, sparingly; fl. and fr. Feb. 1858. No. **277**. In damp gravelly places at the great *represa*, or artificial lake, near Quicuxe, sporadic; fl. Oct. 1860 (seen previously in the same place in 1853 and 1858). No. **277***b*.

LXXVII. MYRSINEÆ.

1. **MÆSA** Forsk.; Benth. & Hook. f. Gen. Pl. ii. p. 641.

1. **M. lanceolata** Forsk. Fl. Ægypt.-Arab. pp. cvi. 66 (1775); Baker in Oliv. Fl. Trop. Afr. iii. p. 492.

Var. **golungensis**.

A small tree, 8 to 15 ft. high; branchlets and much-branched inflorescence pubescent with short spreading rufous hairs; leaves ovate or oval, cuspidate, obtuse at the base, 3 to $7\frac{1}{2}$ in. long by 2 to 5 in. broad; petiole $\frac{1}{2}$ to $1\frac{3}{4}$ in. long; calyx 5-cleft; the lobes scarious-fimbriate on the margin, sparingly red-striate outside; corolla gamopetalous, rotate, 5-lobed; the segments obtuse, imbricate in æstivation, spreading in a stellate manner at the time of flowering, rather fleshy; stamens 5, opposite the corolla-segments and inserted at their base round the throat, exserted; anthers broadly cordate, truncate at the apex, pale yellow with sulphur-coloured pollen or white when effete, 2-celled, dehiscing longitudinally; ovary hemispherical-conical, subsessile, partly free; style thick, short, central, crowned with a capitate-peltate, straight, obsoletely 2- to 4-lobed stigma; fruit capsular.

Golungo Alto.—In primitive forests on the northern side of the mountains of Queta, not common; fr. in July, fl. at end of Dec. 1855. No. **4795**.

The pubescence on the branchlets and inflorescence is like that on *M. palustris* Hochst., but the foliage is considerably larger, and obtuse or rounded at the base of the blades; it sometimes approaches in shape that of *M. cordifolia* Baker, *l.c.* I follow Baker, *l.c.*, in taking a very wide view of the limits of this species; but perhaps this should be considered distinct.

2. **M. angolensis** Gilg in Notizbl. Bot. Gart. Berlin i. p. 72 (1895)

Huilla.—A small tree, with subscandent branches and white flowers. In the forest near the cataract of a stream; fl. 31 Oct. 1859. No. **4796**. Flowers white; fl. and young fr. Nov. and Dec. 1859. No. **4797**.

Bumbo.—No notes. Fl. No. **4798**.

3. **M. Welwitschii** Gilg, *l.c.*

Golungo Alto.—A small tree, 8 to 12 ft. high, with the habit of a *Rhamnus*, oftener a shrub; leaves deciduous, in shape like those of an *Alnus*; flowers small, yellowish; berries orange-coloured, as large as a small pea. In the thin forests of Cacarambola, not uncommon; fl. May 1855, fr. Sept. 1855. No. **4794**. An arborescent shrub, occasionally a small tree of 10 to 12 ft. with the aspect of a young alder; leaves sometimes deciduous sometimes evergreen; flowers white; calyx bi-bracteolate, slightly lepidote-glandular, sub-campanulate, 5-cleft, with obtuse ciliolate lobes; corolla campanulate, milk-

white ; the limb erect, 5-cleft ; the lobes alternating with as many intruded folds ; stamens mostly and typically 5, but not rarely 6 and very rarely 4, included, inserted on the base of the corolla ; anthers ovoid-cordate, yellow, 2-celled, dehiscing longitudinally ; ovary unilocular ; placenta basal, free, comparatively large ; style rather short ; stigma obsoletely lobed ; berry pea-shaped, brick-red-orange, but little juicy, depressedly crowned with the remains of the calyx, 1-celled ; seeds several, impressed on the basal globular rather fleshy placenta. At the outskirts of forests and in thickets between the rivers Cate and Quiapoza in Sobato de Bumba ; fl. and fr. 23 Nov. 1855. No. **4792**. A divaricately branched tree of 10 to 15 ft., with membranous obscurely green foliage and white flowers. At the outskirts of the primitive forest at Cacarambola ; fl. Feb. 1856. No. **4793**.

This species is very nearly related to *M. alnifolia* Harv. Thes. Cap. ii. p. 20, t. 129 (1864).

2. **MYRSINE** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 642.

1. **M. africana** L. Sp. Pl., edit. 1, p. 196 (1753) ; Baker in Oliv. Fl. Trop. Afr. iii. p. 493.

Var. **subintegra** Engl. Hochgebirgsflora p. 331 (1892).

Huilla.—Anthers yellow. In the denser forests of the Monino country on the left bank of the river Monino ; fl. end of Jan. 1860. No. **4802**. Anthers dull blue or bright blue. In mountainous forests near the lake of Ivantâla and Matas de Monino ; male fl. Feb. 1860. No. **4799**. In wooded places in Matas de Monino between the Monino and the lake of Ivantâla ; female fl. end of Feb. and in April 1860. No. **4800**. A shrub, 1 to 2 ft. high, with the habit of *Buxus* ; berries pruinose, purple. In the Monino forests ; fr. end of April and in May 1860. No. **4801**.

This appears to be the typical form of the species.

3. **PATTARA** Adans. Fam. Pl. ii. p. 447 (1763).

Embelia Burm. f. (1768) ; Benth. & Hook. f. Gen. Pl. ii. pp. 1240, 644.

1. **P. Welwitschii** Hiern, sp. n.

A scandent shrub, in habit not unlike a *Scutia* ; the adult stem sometimes spinous ; branches and branchlets horizontal and subterete, glabrate or the latter very shortly puberulous and leafy ; leaves alternate, oval, more or less cuspidate at the apex, obtuse or somewhat wedge-shaped at the base, flaccid and membranous or coriaceous, deep green and rather shining or glossy above, glaucescent-pallid and marked with slender and raised violet-red midrib and nerves beneath, entire repand or minutely denticulate on the margin, 2 to $4\frac{1}{2}$ in. long by 1 to $2\frac{1}{4}$ in. broad ; petiole $\frac{1}{4}$ to $\frac{3}{4}$ in. long, usually spreading and often sinuous ; flowers hermaphrodite, pentamerous, $\frac{1}{10}$ in. long, on rather longer or shorter slender glandular-puberulous pedicels, arranged in numerous approximated axillary or lateral spreading racemes about $\frac{1}{2}$ in. long on the branchlets ; calyx hemispherical, 5-fid halfway, $\frac{1}{16}$ in. in diameter, green, subsequently becoming purple, persistent, unchanged in fruit ; the lobes broadly ovate or deltoid, minutely glandular-ciliolate ; corolla whitish-green ; petals free, oblong,

obtuse at the apex, sessile, broad to the base, rather concave, alternating with the calxy-lobes, nearly valvate in æstivation but the margins very slightly overlapping, minutely glandular inside and on the margins, inserted on the calyx at the base of the ovary; stamens 5, opposite to and shorter than the petals and adnate to them one-third up from the base, glabrous; anthers cordate, apiculate at the apex, introrse, erect, basifixed, 2-celled, dehiscing longitudinally, whitish; disk obsolete or inconspicuous; ovary sessile, ovoid-spherical, red, 1-celled, 1- or 2-ovuled; style filiform, curved at the apex; stigma papillose, fleshy, truncate; drupe green when young, quite black when ripe, as large as and in shape like to a peppercorn or small pea, hard, one-celled, one-seeded, borne on the persistent calyx or its remains, mucronate at the apex with the hardened style or its broken base; epicarp fleshy; endocarp crustaceous; seed white, covered all over with large yellow distant glands; embryo transverse.

Golungo Alto.—In a rather elevated forest among the eastern mountains of Queta, seen only in one spot; fl.-bud and ripe fr. in the middle of Dec. 1855. No. **4803**. In the mountainous forests of central Queta; young fr. beginning of July 1856. No. **4805**. In the thickets of Queta Carengue; fr. middle of August 1856. No. **4804**.

2. **P. pellucida** Hiern, sp. n.

A climbing shrub, rather much-branched; branches dark-ashy, glabrate, lenticellate, subterete, as well as the somewhat puberulous leafy striate branchlets spreading horizontally or even bent backwards; leaves alternate, obovate-oval, rounded or subcuspidate at the apex, obtuse or scarcely wedge-shaped at the base, glabrous, thinly coriaceous, but little shining, obscurely penni-nerved, pellucid-striate, apparently deciduous, $1\frac{1}{2}$ to $4\frac{1}{2}$ in. long by $\frac{2}{3}$ to $2\frac{2}{3}$ in. broad, entire; petiole $\frac{1}{6}$ to $\frac{1}{2}$ in. long; fruit drupaceous, glabrous, black-dotted, pea-shaped, $\frac{1}{3}$ in. in diameter, borne at the base on the small puberulous 4-cleft persistent calyx or on its remains, mucronate at the apex with the hardened rather long obsoletely glandular style or with its broken base, one-seeded; fruiting pedicels $\frac{1}{6}$ to $\frac{1}{4}$ in. long, obsoletely puberulous, rather slender, spreading, arranged in lax axillary or lateral racemes of about $1\frac{1}{2}$ in. long on the branchlets; pericarp somewhat fleshy; endocarp thinly crustaceous; seed spheroidal, about $\frac{1}{5}$ in. in diameter; embryo central in the axis; albumen horny, copious.

Golungo Alto.—In the primitive forests of Sobato de Queta; fr. beginning of July 1856. No. **4806**.

This is nearly related to *Pattara kilimandscharica* (Gilg in Engl. Bot. Jahrb. xix., Beibl. 47, p. 45; 21 Aug. 1894), but it differs in the shape of the leaves, the infructescence is laxer, the fruit larger, etc.

The following No. is perhaps a new species of *Pattara*:—

Golungo Alto.—A glabrous glossy shrub, as tall as a man; branches rather strict, terete, pallid; branchlets slender, leafy; leaves alternate, exstipulate, ovate, much and rather abruptly acuminate at the apex, rounded subtruncate or very obtuse at the base, papery, rather dry as is usual in Myrtaceæ, $1\frac{1}{2}$ to 3 in. long by $\frac{2}{3}$ to $1\frac{1}{3}$ in. broad, entire,

slightly undulate, deep-green, pellucid-striate, paler green beneath; midrib raised beneath; venation delicate, not conspicuous; petiole dusky, $\frac{1}{12}$ to $\frac{1}{8}$ in. long, usually patent. At the outskirts of forests about the Capopa spring in Sobato de Bumba; without either fl. or fr. end of Aug. 1855. No. **4835**.

LXXVIII. SAPOTACEÆ.

1. **CHRYSOPHYLLUM** L.; Benth. & Hook. f. Gen. Pl. ii. p. 653.

1. **C. Cainito** L. Sp. Pl., edit. 1, p. 192 (1753).

Sierra Leone.—A small tree; shoots rufous-tomentose, with alternate leaves. Near Freetown; without either fl. or fr. Sept. 1853. A West Indian species, doubtless cultivated. No. **6735**.

2. **C. africanum** Alph. DC. Prodr. viii. p. 163 (1844); Baker in Oliv. Fl. Trop. Afr. iii. p. 500.

C. macrophyllum Sabine & G. Don in Trans. Hort. Soc. v. p. 458 (1824); non Gaertn.

Island of St. Thomas.—Branchlets erect-patent; leaves alternate, simple. Without either fl. or fr. Dec. 1860. Local name "Umtuem." No. **6761**.

This species is probably the Cainito mentioned in Afzelius' Report on Sierra Leone, p. 172, n. 40 (1794). In our specimens the foliage is rather smaller than in those from Sierra Leone.

3. **C. cinereum** Engl. Bot. Jahrb. xii. p. 522 (1890).

C. Stuhlmannii Engl. Pfl. Ost-Afr., C., p. 306 (1895), as to Buchanan's cited n. 793. Cf. *Bumelia* Afzel. Report S. Leone, p. 172, n. 41 (1794).

Cazengo.—A tree of moderate size, 20 to 25 ft. high, with the habit of the laurels; branches spreading; branchlets much scarred, curved, twisted; flowers monopetalous, pentandrous, apparently white; style thick, columnar, truncate; drupe 1-seeded. At the outskirts of forests along the river Luinha, rather rare; with marcescent fl. and young fr. Dec. 1854. No. **4811**.

Golungo Alto.—A tree of 15 to 20 ft., with the habit of a *Laurus* or *Arbutus*; leaves coriaceous, shining, fasciculate at the apex of the branches; flowers numerous, situate below the leaves on the branches of the previous year, very shortly pedunculate. On the left-hand side of the road from Cambondo towards the river Luinha; fr. Jan. 1855. Coll. Carp. 695. In very young fr. after the fall of the corolla. No. **4818**.

Pungo Andongo.—A tree, 15 to 20 ft. high, patently branched above; leaves coriaceous, glossy, silvery-shining beneath. In the little forests of the præsidium, sporadic; fl.-bud beginning of Nov. 1856. No. **4823**. A tree of 20 to 25 ft., sparingly milky in all parts; trunk 1½ to 2 ft. in diameter at the base; branches patent; leaves coriaceous, rigid, obscurely green and richly shining above, whitish green and shining somewhat like silver beneath; corolla campanulate-rotate; the limb 5-cleft, erect-patent, from whitish to greenish; stamens 5, opposite to the corolla-lobes; anthers extrorse, incumbent, 2-celled, sagittately divaricate below; very rarely there is present a sixth stamen, alternating with a corolla-lobe, shorter than the rest and surmounted with a sterile anther; ovary 5-celled; the cells uni-ovulate; style thick, subcylindrical, bearing at its apex an obscurely 5-lobed

stigma (or, rather, crowned at the apex with 5 depressed stigmatic tubercles), these 5 elevated points of the stigma being copiously milky at the time of the flower, and so appearing whitish. At the base of the elevated rocks of the præsidium and in their fissures, sporadic; fl. middle of Nov. 1856. No. **4824**. A tree of moderate size, with a dense obovoid head. In the dense primitive forests on the Calemba island in the river Cuanza; young fr. March 1857. No. **4826**.

With this species, the type No. of which is 4824, must be compared *Sideroxylon longistylum* Baker, *l.c.*, p. 502.

4. **C. Welwitschii** Engl. Bot. Jahrb. xii. p. 521 (1890); Elliot in Journ. Linn. Soc. xxx. p. 84 (1894).

Sideroxylon sp., Ficalho, Pl. Uteis, p. 211 (1884).

Golungo Alto.—A slender shrub, climbing to a height of 25 ft. flowers small, white. In dense forests among the mountains of the eastern Queta; fl. in Jan. and March; fr. Sept. 1855. No. **4831**. A scandent shrub, trunk scarcely an inch thick at its base, with long spines. In Mata de Mangue; fl. April 1855. No. **4833**. A subscandent shrub; leaves evergreen, glossy, penni-nerved; flowers axillary, white; corolla waxy, rather fleshy. In dense thickets among the mountains on the north-eastern side of Queta; fl. beginning of June 1855. No. **4832**. In the denser primitive forests of Serra de Alto Queta by streams; fl.-bud June 1855. No. **4834**. An evergreen shrub, climbing far and high; branches strigose-tomentose, spreading horizontally; leaves shining above, paler beneath, more or less distichous, very densely penni-nerved, cartilaginous on the margin; flowers globose, very small, scarcely $\frac{1}{12}$ in. in diameter, axillary, solitary or 2 or 3 (or in male flowers several) together; corolla gamopetalous, sub-urceolate; the limb deeply crenate; the lobes erect or rather connivent; stamens (in female flowers) 0; style thick, straight; ovary superior, free, hirsute with ferruginous hairs. In the more elevated wooded mountainous parts of Sobato de Bumba, near Capopa; fl. 28 July 1855. No. **4830**. An elegant, climbing shrub. Serra de Alto Queta; fr. August 1855. Coll. Carp. 699.

This shrub is called by the negroes in Golungo Alto "Jungingi," and the seeds "Jimbundo"; the bony, highly polished seeds are worn by the natives as an ornament, and are suspended from the neck in a knot, as an amulet. According to Ficalho, *l.c.*, the native name of the shrub is Tingingi.

5. **C. argyrophyllum** Hiern, sp. n.

A beautiful tree, 20 to 40 ft. high or less, with a broad leafy head; trunk 2 to 3 ft. in diameter, with a hard excellent wood; branches spreading; branchlets dark-ashy, subterete, nodulose, glabrate and closely scarred or towards the tips puberulous and leafy; leaves alternate, crowded towards the tips of the branchlets, oblanceolate or somewhat oblong, retuse or emarginate and sometimes minutely mucronulate at the apex, wedge-shaped or narrowed to or towards the base, coriaceous, rigid, erect spreading or reflected, glaucous-shining and glabrous above, silvery-silky with short adpressed sometimes sub-obsolete tomentum beneath, 3 to $9\frac{1}{2}$ in. long by $\frac{3}{4}$ to $2\frac{1}{4}$ in. broad; margin thinly cartilaginous, recurving, entire; lateral veins very numerous, delicate, inconspicuous, widely spreading, anastomosing beneath in a sinuous

line a little within the margin; petiole $\frac{1}{4}$ to $\frac{3}{4}$ in. long, robust, puberulous, sulcate when dry; stipules lanceolate, scarcely acute, puberulous, deciduous; flowers whitish, $\frac{1}{3}$ in. long, densely clustered on the branchlets below the leaves; peduncles $\frac{1}{5}$ to $\frac{1}{2}$ in. long, strigulose-silky and glandular, pallid; calyx $\frac{1}{3}$ in. long, turbinate-campanulate, deeply 5- or 4-lobed, pallid-hairy outside, glabrous inside; segments imbricate, ovate, obtuse; glabrous or nearly so, deeply 5-lobed; stamens 5, inserted on the corolla-segments near their bases, opposite, glabrous, exserted; filaments $\frac{1}{12}$ in. long; anthers about as long; ovary hairy; style glabrous, columnar, scarcely equalling the filaments, undivided; fruit edible, in shape like a cherry, about $\frac{3}{4}$ in. long, $\frac{2}{3}$ in. thick, tomentellous (when rather young), apiculate with the persistent style or its remains.

Pungo Andongo.—In dense primitive forests along the banks of the river Mangue, sparingly; without either fl. or fr. March 1857. An ornament to the forests. No. **4827**.

Bumbo.—In the forests of the district: late fl. and early fr. Oct. 1859. No. **4828**. In shady places in Serra de Xella; a small tree in fr. Oct. 1859. No. **4829**.

This species occurred also in the district of Huilla between the town and Humpata, 22 Oct. 1859; it is nearly related to *C. Msolo* Engl. Pfl. Ost-Afr. C, p. 306, t. 37 (1895), but differs in its stipules, length of petiole, etc.; it is also allied to *C. magalismontanum* Sond. The native name is "Mutambote," and on its mossy bark grew Hepatic n. 251 and Lichen n. 424.

6. **C. Disaco** Hiern, sp. n.

A large tree, with much milky juice and the general habit of a laurel, even the fruit resembling that of the same genus; branches glabrate, dark-ashy, rather rough; branchlets leafy, somewhat furrowed, sparingly hairy at the tips, covered with a cinnamon-coloured bark; leaves alternate, crowded especially towards the ends of the branchlets, exstipulate, obovate oblanceolate or elliptical, rounded or obtusely narrowed at the apex, more or less wedge-shaped to or towards the base, glabrous, of an opaque green colour, a little glossy above, very pallid beneath, 3 to 12 in. long by 1 to $4\frac{1}{2}$ in. broad; midrib yellowish, strongly raised beneath and thickening towards the base; lateral veins numerous (18 to 20 on each side of the midrib), clearly marked but rather slender beneath, depressed above; reticulation inconspicuous, depressed on both faces in the dry state; margin narrowly revolute, entire or very nearly so; petiole $\frac{1}{6}$ to $\frac{1}{2}$ in. long, puberulous or glabrate; flowers not seen; fruit drupaceous, ellipsoidal (when dry), $\frac{7}{8}$ in. long, $\frac{5}{8}$ in. broad, $\frac{2}{3}$ in. thick, rather shining, glabrate except the apiculate tip, with the persistent adpressed puberulous hard rather woody calyx at the base, 1-celled, 1-seeded; fruiting peduncles puberulous, hard, lateral on the branchlets below the leaves, $\frac{1}{4}$ to $\frac{1}{2}$ in. long, in the approximated axils of fallen leaves, solitary or a few together in each such axil, ascending or spreading; fruiting calyx about $\frac{1}{3}$ in. in diameter, shortly 5-lobed, the lobes rounded, glabrous within; seed (when dry) ellipsoidal,

polished at least on one side, $\frac{2}{3}$ in. long, $\frac{2}{5}$ in. broad, $\frac{3}{8}$ in. thick, exalbuminous; embryo (when dry) ellipsoidal, $\frac{1}{2}$ in. long, $\frac{1}{3}$ in. broad, $\frac{1}{4}$ in. thick; cotyledons semi-ellipsoidal, subequal; radicle small; young fruit, as well as the branchlets, emitting a whitish milky juice, tipped with the more or less persistent style which is hairy at the base.

Golungo Alto.—In the less dense forests among the mountains of Queta, sporadic; young fr. end of Aug. 1855. No. **4812**. and Coll. Carp. 696. Queta; fr. Sept. 1855. Coll. Carp. 700 and No. **4820**. Queta; without either fl. or fr. Oct. 1855. Probably this species. No. **4819**.

The natives call this plant "Disaco," and it is doubtless the same as that mentioned by Welwitsch, Apont., p. 552 under n. 107, by the name "Dicaso"; according to a ms. note of his, the fruit has intoxicating effects when eaten in some quantity. Ficalho, Pl. Uteis, p. 209 (1884) referred the plant to *Sideroxylon*, and had previously in Bol. Soc. Geogr. Lisb., Ser. 3, p. 479, united it with *Sapota cerasifera* Welw., which is a *Chrysophyllum*. Although in the absence of the flowers it is impossible to feel sure about the genus, it appears to me better to place it under *Chrysophyllum*. No. 4819, which I have mentioned under this species, should also be compared with *C. cerasiferum*; the two species differ by the latter having shorter peduncles, and, according to Ficalho, by the shape of the leaves.

7. C. cerasiferum.

Sapota cerasifera Welw. Apont. p. 585. n. 17 (1859).

A handsome tree of 20 to 30 ft. with a widely spreading evergreen head, or an extensive tree with the habit somewhat of *Machilus odoratissima* Nees, well worth cultivating; branchlets dark-ashy, nodulose, leafy especially towards the apex, glabrate except the tips; leaves alternate, obovate or elliptical, obtuse or subcuspidate at the apex, wedge-shaped at the base, rigidly coriaceous, rather shining, glabrate, entire, narrowly revolute on the margin, 3 to 8 in. long by 1 to 3 in. broad, exstipulate; lateral veins 8 to 12 on each side of the midrib, clearly marked on the lower face but rather slender, narrowly depressed on the upper face; midrib strong beneath; reticulation inconspicuous, depressed; petiole $\frac{1}{4}$ to $\frac{1}{2}$ in. long; flowers about $\frac{1}{5}$ in. long, often precocious, on shorter puberulous peduncles, crowded in approximated axillary or lateral clusters; calyx $\frac{1}{8}$ in. long, turbinate-ovoid, 5-cleft; the lobes ovate or rounded, much imbricate, erect, puberulous outside; corolla glabrous, the tube short, the lobes 5, revolute, ovate, subacute, $\frac{1}{12}$ in. long; stamens 5, glabrous, opposite the corolla-lobes and shorter than them, about $\frac{1}{16}$ in. long; anthers nearly as long as the filaments, ovate, acuminate; filaments flattened, sublinear, revolute with the corolla-lobes; ovary hairy, conical; style columnar, subglabrous towards the apex, undivided, exserted; fruit in size and taste like a large cherry, (in the dry state) about an inch long, very well flavoured but slightly pungent, glabrate, with the not much increased adpressed calyx at the base, and apiculate at the apex with the base of the broken style; fruiting peduncle about $\frac{1}{4}$ in. long, the fruiting calyx $\frac{1}{3}$ to $\frac{2}{5}$ in. in diameter;

seed solitary, ellipsoidal, $\frac{3}{4}$ in. long, $\frac{1}{2}$ in. broad, $\frac{2}{5}$ in. thick, polished at least on one side, exalbuminous; embryo $\frac{2}{5}$ in. long, $\frac{3}{5}$ in. broad and thick; radicle very small; cotyledons semi-ellipsoidal, $\frac{3}{5}$ in. long.

Golungo Alto.—In primitive forests among the eastern Queta mountains: fl. end of June 1856. Nos. **4817**, **4825**.

Pungo Andongo.—In the deep valleys among the gigantic rocks on the northern side of the præsidium, sporadic; ripe fr. Jan. 1857. No. **4821**. In the little forests of Catete in the præsidium; fl.-bud April 1857. No. **4822**. Near Catete; fr. June 1857. Coll. Carp. 694.

This is nearly related to *C. albidum* G. Don.

2. **SIDEROXYLON** Dill., L.; Benth. & Hook. f. Gen. Pl. ii. p. 655

1. **S. densiflorum** Baker in Oliv. Fl. Trop. Afr. iii. p. 503; Ficalho, Pl. Uteis, p. 210 (1884).

Island of St. Thomas.—A beautiful tree, called by the Portuguese colonists "Páo Azeitona" (olive-wood). In the denser forests between the town and Monte Caffé; without either fl. or fr. Dec. 1860. Nos. **4839**, **6764**.

The determination is rather doubtful; the foliage differs from that of the type of the species by the little prominence of the lateral veins. According to Ficalho, *l.c.*, the tree in St. Thomas is reported to reach 60 ft. in height.

3. **MIMUSOPS** L.; Benth. & Hook. f. Gen. Pl. ii. p. 661.

1. **M. angolensis** Engl. Bot. Jahrb. xii. p. 523 (1890).

Ambriz.—A small tree, 6 to 10 ft. high; branches spreading; branchlets mostly ternate, the terminal ones nodding or even pendulous; leaves crowded at the tips of the branchlets; flowers sweet-scented, in colour from orange to dusky or cinnamon; fruit drupaceous, fleshy, subspherical, yellow. In hilly bushy places near Ponta d'Ambriz, rather rare; fl. Nov. 1853. No. **4836**.

Congo.—A small tree. At Ponta do Padrão, near the mouth of the river Zaire, Dec. 1857; a poor specimen in fr., probably belonging to this species. No. **4838**.

2. **M. cuneifolia** Baker in Oliv. Fl. Trop. Afr. iii. p. 506.
Kaukenia cuneifolia O. Kuntze, Rev. Gen. Pl. ii. p. 406 (1891).

Ambriz.—A tree, 15 ft. high; trunk patently branched a little above the base; branches rather elongated, ascending; branchlets fasciculately leafy. In wooded situations in Mossul domain, rather rare; without either fl. or fr. end of Nov. 1853. Apparently this species. No. **4837**.

3. **M. Welwitschii** Engl. Bot. Jahrb. xii. p. 524 (1890).

Golungo Alto.—A tree, 10 to 15 ft. high, patently branched; leaves dryly coriaceous, penni-nerved, calling to mind those of Guttiferæ. In the primitive forests among the mountains of the eastern Queta; without either fl. or fr. March 1856. No. **4815**. A tree, 25 to 30 ft. high; trunk 9 in. in. diameter at the base, unbranched to the height of 10 to 15 ft.; the lower branches directed gradually downwards; the crown leafy, oblong, evergreen; leaves coriaceous, rather dry, brittle, but little glossy; calyces and peduncles ferruginous-lepidote, remaining in the same state from March to the end of July.

In the more elevated primitive forests among the mountains of the central Queta, sporadic; fl.-bud, March to the end of July 1856. No. **4814**. A tree, 30 ft. high; trunk about a foot in diameter near the base; berry acuminate; the acumen ½ in. long, formed by the hardened persistent style, at length reduced or deciduous. Only one fruiting specimen found at the beginning of August 1856 on a tree covered with flower-buds. No. **4816**.

This tree is, perhaps, that with the habit of a laurel, mentioned by Welwitsch, Synopse Explic., p. 14, n. 33, as having strong heavy and durable wood used by the negroes for the building of their huts, and as growing in the elevated forests in the Sobato de Quilombo-Quiacatubia and neighbourhood, where it is called "Cafequesu de Monte" and also "Quisunhunga." Compare Ficalho, Pl. Uteis, p. 211 (1884).

4. **M. frondosa** Hiern, sp. nov.

A very elegant and useful tree, 15 to 60 ft. high, beautifully frondose; wood whitish, hard, durable; branchlets dark-ashy, nearly glabrous, somewhat angular and sulcate-striate, leafy throughout; leaves alternate, exstipulate, obovate-oblong, rounded emarginate or obtusely cuspidate at the apex, more or less wedge-shaped at the base, nearly glabrous or obsoletely strigulose-silky, entire and narrowly revolute on the margin, coriaceous, shining, deep green with narrowly depressed midrib above, paler or silvery and with prominent midrib beneath, 4 to 14 in. long by $1\frac{2}{3}$ to 5 in. broad; lateral veins numerous, slender, not conspicuous, widely spreading; petiole $\frac{1}{2}$ to $1\frac{1}{2}$ in. long, strong, channelled above; flowers hermaphrodite, clustered, many together, axillary, $\frac{1}{2}$ to $\frac{2}{3}$ in. long, on nearly as long obsoletely puberulous-strigulose pedicels, ebracteolate, hexamerous, violet-coloured; calyx-lobes 6, densely clothed on the back with short thick whitish deciduous hairs, biseriate, glabrous inside, ovate or deltoid, reflected at the time of the open flower; corolla glabrous; tube rather short; lobes 18, the outer 12 of them ovate or lanceolate, reflected; the inner 6 obovate or oblanceolate; stamens 6, glabrous, exserted; filaments tapering, about $\frac{1}{16}$ in. long; anthers about $\frac{1}{12}$ in. long; staminodes 6, acute, cleft; ovary conical, strigulose with dense short thick deciduous pale-tawny hairs; style glabrous, straight, columnar, exserted; fruit drupaceous ovoid, subglabrate, $\frac{2}{3}$ in. long, $\frac{1}{2}$ in. thick, tipped with the persistent style or its remains; seeds 3 or 4, ovoid-oblong, glossy, $\frac{1}{2}$ in. long, $\frac{1}{4}$ in. broad, $\frac{1}{6}$ in. thick.

Golungo Alto.—In the forests of Alto Queta, where it forms one of their chief component parts and decks the tops of the mountains, plentiful, flowering in April and again in October; fl. end of April 1855. Nos. **4813** and **4813***b*; fr. March 1855. Coll. Carp. 697. In elevated primitive forests among the mountains of Alto Queta; fl.-bud 28 Feb. 1855. No. **6719**. Fr. and seeds June 1856. Coll. Carp. 698.

This tree is called by the natives "Cafequesu" or "Cafuquesu," and is mentioned by Welwitsch, Synopse Explic. p. 15, n. 38, who states that it somewhat resembles a laurel in appearance, that its trunk attains 2 to $2\frac{1}{2}$ ft. in diameter, and that its timber is well adapted for hut-building and joinery. It grows in the valleys of mountains composed of mica-schist, in Golungo Alto, Cazengo, and in the countr

near the Mahungos. Compare also Ficalho, Pl. Uteis, p. 211 (1884). It is nearly related to *M. Welwitschii* Engl.

5. **M. andongensis** Hiern, sp. nov.

A small tree; head spreading widely; wood very hard; branches and branchlets arranged in a sub-verticillate manner, the former ashy and glabrate, the latter tawny shaggy-tomentose towards the extremities and leafy throughout; leaves alternate, exstipulate, oval or elliptical, wavy and obtusely cuspidate at the apex, narrowed at the base sometimes obtusely so, coriaceous, glabrate or the midrib somewhat pubescent beneath, dark green and glossy above, rather paler beneath, entire on the narrowly cartilaginous somewhat undulate margin, 2 to 3 in. long by $\frac{3}{4}$ to $1\frac{3}{8}$ in. broad; lateral veins and reticulation raised on both faces but not conspicuous; petiole $\frac{3}{8}$ to $\frac{7}{8}$ in. long, tomentellous or glabrate, rather slender; flowers axillary; peduncles solitary, tomentellous or subglabrescent. $\frac{1}{3}$ to $\frac{2}{3}$ in. long; calyx-segments biseriate, the outer ones 4, tomentose outside, ovate, sub-obtuse, nearly $\frac{1}{4}$ in. long; the inner ones 4, lanceolate, scarcely acute, nearly as long; corolla fallen; young fruit subglobose, pilose, rather exceeding the calyx, tipped with the glabrous undivided style which is $\frac{1}{6}$ to $\frac{1}{4}$ in. long.

Pungo Andongo.—In primitive forests between Pedras de Guinga and Candumba; young fr. March 1857. No. **1229**.

This species belongs to the section Quaternaria, Alph. DC., and is nearly related to *M. Kummel* Hochst., but differs from it by the peduncles being solitary in the axils and shorter than the petioles, by longer petioles, etc.

LXXIX. EBENACEÆ.

These plants in Portuguese West Africa chiefly occur south of the river Cuanza in the interior highlands, particularly species of *Euclea*, all of which latter have edible fruit; Welwitsch states that on several occasions he satisfied his hunger and still oftener his thirst by eating the fruit of *E. pseudebenus* E. Mey.; the fruit of several species of *Diospyros* also are edible. The wood of all the species is very firm and heavy, but becomes black only in old trees and then only in the centre; even the young trees, on account of the strength of their wood, are searched for and felled by the negroes, and for this reason stout trunks very rarely occur. In Golungo Alto the best timber is produced by *Maba Mualala* Welw. and *D. Dendo* Welw., but it is often streaked with white and near the bark the wood is always wholly white; these trees occur in highland forests also in the districts of Dembos, Dande Alto, etc., and are often interspersed with trees of *Albizzia Welwitschii* Oliv. and *Corymanthe paniculata* Welw. Along the road-sides, where they are annually cut back, several species of *Diospyros* and *Euclea*, which would grow into small trees, are seen as undershrubs or even as herbaceous

shrublets, only 6 to 12 in. high; but even in such state they frequently bear flowers and fruits.

1. **ROYENA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 663.

1. **R. pallens** Thunb. Prodr. Pl. Cap. p. 80 (1794); Hiern in Oliv. Fl. Trop. Afr. iii. p. 510.

Huilla.—An evergreen shrub of 6 to 10 ft., occasionally taller, and, perhaps, in primitive forests a tree; flowers white, rather fleshy. In bushy and wooded places along the banks of the river Monino and the Lopollo stream; fl. Dec. 1859. A rather narrow-leaved form. No. **2534**. A shrub 4 to 6 ft. high, rarely a small tree of 8 ft., repeatedly branched in a divaricate manner; flowers whitish; calyx usually 5-, rarely 4-cleft. In thin open forests and in thickets between Lopollo and the river Monino; young fr. Dec. 1859, fl. Jan. 1860. A rather broad-leaved form. No. **2533**. A shrublet, scarcely 9 in. high; stems ascending. In elevated rocky parts of Morro de Monino; without either fl. or fr. April 1860. Apparently in a sickly state, burdened with the Fungus n. 128, *Æcidium Welwitschii* Lagerh.; probably belonging to this species. No. **1255**.

2. **R. cistoides** Welw. ex Hiern, Monogr. Eben. in Trans. Cambr. Phil. Soc. xii. p. 87 (1873), and in Oliv., *l.c.*, p. 511.

Pungo Andongo.—A procumbent shrub, 1 to 1½ ft. high, branched from the base, whitish-hoary, resembling in habit a species of *Cistus*; wood very hard, tenacious; young branches erect, the fruiting ones arching-ascending; leaves silky-hoary; fruit greenish-glaucous when young, at length turning golden-yellow, shining, received at the base in the 5-cleft calyx, obtusely mucronate at the apex, globular, hard, 8- to 12-celled, 1- to 6-, mostly 3- to 5-seeded, several of the cells being abortive. In wooded sandy sunny forests and in thickets between Condo and Quisonde at the river Cuanza; fr. March 1857. No. **2532**, and Coll. Carp. 703.

2. **EUCLEA** L. edit. Murr.; Benth. & Hook. f. Gen. Pl. ii. p. 664.

1. **E. pseudebenus** E. Mey. ex Drège, Cat. Pl. Exsicc. Afr. Austr. p. 7 (1837); Alph. DC. in DC. Prodr. viii. p. 217 (1844); Hiern in Oliv. Fl. Trop. Afr. iii. p. 512.

Diospyros pseudebenus Parment. in Ann. Univ. Lyon, vi. fasc. 2, p. 138 (1892).

Mossamedes.—A shrub, 4 to 8 ft. high, much branched from the base upwards; branches and branchlets erect; leaves coriaceous; fruit edible, resembling in look and size a whortleberry, but less juicy and not so pleasant, black-bluish, drupaceous, but little juicy; seed solitary. In sandy bushy places along the banks of the rivers Bero and Girâul, very plentiful; in Mata dos Carpinteiros; fr. July 1859. No. **2544**. A shrub of 5 to 8 ft. with the habit of a *Daphne*; flowers dioecious, gamopetalous; calyx of the male flowers 5-cleft; corolla globose-urceolate, 5- or 6-lobed, rather fleshy, white, tomentose outside; stamens 12 to 16, inserted at the bottom of the corolla-tube; anthers erect, hirsute; filaments short; pistil obsolete. Fruits pea-shaped, edible, pleasantly acidulous, clustered in great abundance on the branchlets, glaucous-bluish like those of a juniper. In bushy places and in small open woods composed of *Tamarix orientalis* Forsk. and species of *Cordia*, along the sandy banks of the rivers Bero and

Maiombo but scarcely reaching as far as Cazimba, not far from the sea, very plentiful; fl. early in Oct. and fr. later in Oct. 1859. No. **2543**. Seeds furrowed. COLL. CARP. 705.

This, as are also other species or forms of the genus, is called by the negroes "Emboto," or "N-boto." The flower-buds are frequently to be found in June and July; the flowers are open in June and July.

2. **E. lanceolata** E. Mey., *l.c.*; Alph. DC., *l.c.*, p. 218; Hiern, *l.c.*; Ficalho, Pl. Uteis, p. 212 (1884).

a. Leaves glabrous and shining, the young ones often lepidote.

PUNGO ANDONGO.—An arborescent shrub, sometimes dispersedly, sometimes verticillately branched. In rough bushy places at the sides of the gigantic rocks of Pedras de Guinga; young fr. March 1857. Doubtfully placed here. No. **1247**.

BENGUELLA.—A shrub, 4 to 6 ft. high, virgately branched; branchlets both opposite and alternate; female flowers racemose-spicate, whitish-reddish or whitish; fruit rather reddish, 1-seeded, deciduous. In maritime thickets near the town towards the south; ripe fr. middle of June 1859. No. **2545**.

MOSSAMEDES.—An evergreen, resinous shrub, occasionally arborescent, 7 to 12 ft. high. In sandy thickets along the inner banks and rocks of the river Bero, plentiful; few fl. June; fr. July 1859. Negro name, "N-boto" or "Emboto" (as also *E. pseudebenus* E. Mey.). No. **2546**. A slender, much-branched shrub, 5 to 8 ft. high; branchlets opposite or occasionally ternate or quaternate; leaves mostly opposite or occasionally alternate, almost all lanceolate and wavy on the margin, the younger ones lepidote; male flowers whitish-rosy, tetramerous; stamens usually 16. In rocky places and in beds of *Tamarix orientalis* Forsk. and *Ximenia americana* L., along the river Maiombo from Pedra do Rei ascending almost as far as Bumbo; plentiful; male fl. Oct. 1859; in the interior from 300 to 1500 ft. alt. No. **2547**.

BUMBO.—A shrub, 8 ft. high; branchlets mostly opposite; leaves much waved on the margin, glossy, scarcely ever lepidote; male racemes 9- or 10-flowered; pedicels opposite, subsecund, a little longer than the flowers, rather firm; flowers whitish; calyx-lobes 4, deltoid, abruptly acute; corolla glabrous inside, 4-cleft almost to the base, the segments broadly oblong, rounded or very obtuse or occasionally subemarginate, rather spreading on account of the turgid lanceolate anthers; stamens 16; filaments all free; ovary rudimentary. On somewhat rocky bushy slopes about Bumbo, in a sterile district, sporadic; male fl. end of Oct. 1859. No. **2548**.

HUILLA.—A rather rigid shrub, 4 to 6 ft. high, with a tortuous ramification; leaves mostly wavy. In shrubby places along the outskirts of forests between Mumpulla and Nene; female fl., mostly fallen, very few remaining as young fr., end of Oct. 1859. No. **2549**.

β. Leaves and shoots pubescent.

HUILLA.—A shrublet, 1 to 1½ ft. high, with the habit almost of *Andromeda*; stems and branches hispid-pilose; leaves dimorphous, those near the base of the stems twice or thrice broader than the others and obtuse, all glabrous above and pubescent beneath; flowers diœcious, white; calyx of the male flowers short, 4-lobed or rarely obscurely 5-lobed; the lobes deltoid, acute; corolla very deeply 4-lobed or 4-partite; the segments obovate-elliptical, rounded-obtuse, erect, rather concave and fleshy, occasionally scarcely connate even at the base and nearly making a tetrapetalous corolla; stamens 8, 9, 14.

16, or 17 ; anthers pilose towards the apex, at the apex itself sparingly fasciculate-barbellate with a few hairs, the cells lateral ; ovary rudimentary, densely fimbriate-pilose below, centrally elongate-conical above and almost resembling 4 closely combined stigmas. On bushy somewhat rocky slopes near Mumpulla, not uncommon ; male fl. Oct. 1859. No. **2550**. A sub-cæspitose, rather rigid shrublet, like the last No. in size and habit. In bushy pastures where the thickets are annually burnt on the right bank of the Lopollo stream towards Jâu, more or less in masses ; male fl. Nov. 1859. No. **2551**. In same locality, in company with dwarf Myrtaceæ (cf. *Eugenia coronata* Vahl, var. *salicifolia* ; Welw. Nos. 4392, 4393) ; fr. Feb. 1860. No. **2551***b*. A shrublet, 9 or scarcely 18 in. high ; leaves coriaceous, rigid, glossy above. In the same locality and like company as the last ; flemale fl. end of Nov. 1859. No. **2552**. A shrublet, almost an undershrub, about 1½ ft. high ; rootstock woody ; stems several ; berries black-purple, edible. On the sandy-earthy bushy slopes of pastures along the right bank of the Lopollo stream, in company with dwarf species of *Eugenia* and *Gymnosporia* (cf. *G. senegalensis* Loes., var. *pumila* ; Welw. No. 1346) ; ripe fr. end of Jan. 1860. The similarity of this plant with *Eugenia coronata* Vahl, var. *salicifolia*, is so close that a general or superficial description would apply almost as well for either plant. Perhaps it is only a state of this *Euclea* become in fully ripe fruit nearly glabrous. No. **2553**. A shrublet, scarcely a foot high, branched from the base ; leaves coriaceous ; fruit baccate, 1-seeded ; seed precisely spherical, pisiform ; testa hard-woody. In the bushy parts of Humpata ; fr. 24 April 1860. Apparently this species. Coll. Carp. 704.

3. **E. multiflora** Hiern, Monogr. Eben., *l.c.*, p. 100, t. 3 ; and in Oliv. Fl. Trop. Afr. iii. p. 513.

Pungo Andongo.—A tree-like shrub, 4 to 7 ft. high ; trunk erect, straight, 2 to 2½ in. in diameter at the base, branched towards the apex ; branches spreading ; branchlets erect-spreading, in the living state covered as well as the fruit with white felt which soon turns rufous ; leaves coriaceous, above remarkably shining with a deep green lustre and with elevated reticulation, whitish-hoary with white rather long adpressed hairs beneath. In wooded rocky places in Barranco de Catete, at the back of the præsidium ; young fr. Dec. 1856. No. **1257**. A small tree, 7 to 8 ft. high ; branches erect-spreading ; leaves coriaceous, shaggy-tomentose beneath. In the taller thickets near Catete, in the præsidium ; without either fl. or fr. Dec. 1856. Perhaps a form of this species. No. **1243**.

Huilla.—A handsome shrub or small tree, 5 to 8 ft. high ; trunk simple, branched like a besom towards the apex. In thickets at the outskirts of forests near Lopollo ; without either fl. or fr. Dec. 1859. The leaves are frequently burdened with an *Erineum* (Welw. Fungi, n. 139). No. **1258**. An arborescent shrub, 4 to 8 sometimes 10 ft. high, distinguished by a very dense head, a dusky green object as seen from a long distance ; wood hard ; in the female flower calyx-lobes 4, short, acute, broad at the base ; corolla tubular, quadrifid half-way, with obtuse lobes ; staminodes represented by a ring of hairs which persist at the bottom of the calyx-tube after the fall of the corolla ; fruit baccate, hirsute-tomentose outside, 1- or very rarely 2-seeded, apiculate with the thick firm straight style ; stigma capitate, with several mamillæ ; the style is occasionally bipartite and then less thick and more elongated, with the stigmas a

little smaller. In the thin bushy forest of Mata de Monino ; young fr. Feb. 1860. No. **2557**. A tree-like shrub, 4 to 8, usually only 4 ft. high, with a very dense black-green head and sub-verticellate, twiggy branches. In wooded places with tall bushes along the denser forests from Lopollo towards Jâu, in Mata de Jâu, not plentiful ; fl.-bud end of May 1860. No. **2555**.

No. **2556** is vacant, the plant intended for this No. having been included under No. 1258 as given above. No. **2556***b* consists of a leafy shoot, without either fl. or fr., of a small tree or rather an arborescent shrub, 8 ft. high, tomentose almost in every part, which occurred in the Bumbo district at the base of Chão da Xella in Oct. 1859 ; it can scarcely belong to this species, and indeed is a doubtful member of Ebenaceæ.

3. **MABA** Forst. ; Benth. & Hook. f. Gen. Pl. ii. p. 664.

1. **M. Mualala** Welw. ex Hiern, Monogr. Eben. in Trans. Cambr. Phil. Soc. xii. p. 111 (1873), and in Oliv. Fl. Trop. Afr. iii. p. 515 ; Ficalho, Pl. Uteis, p. 213 (1884).

Ebenus Mualata O. Kuntze, Rev. Gen. Pl. ii. p. 408 (1891).

Loanda.—A tree, tall enough in the interior, but in the coast region scarcely more than a small one or rather a much-branched shrub of 3 to 6 ft., hardly ever flowering ; leaves coriaceous, deep black-green, glossy, evergreen. In the thickets, the remnant of the ancient forests, near Imbondeiro dos Lobos, very rare, June 1858 ; also near Quicuxe, 7 Feb. 1859 ; young shoots of a tree formerly cut down or burnt ; without either fl. or fr. No. **2542**.

Golungo Alto.—A beautiful tree with the habit of a laurel ; trunk strictly erect, 15 to 30 ft. high and more ; leaves evergreen, deep-green, remarkably glossy ; fruit black-purple, sparingly juicy, one-seeded ; seed spherical ; calyx trifid. Near Trombeta, without either fl. or fr. March 1855 ; in the denser forests near Trombeta, Sange, and N-delle ; ripe fr. March 1856. The timber is very hard, valuable, and usually but not always dusky-black in the centre. No. **2539**. An evergreen tree of 20 to 35 ft. in height, with valuable wood. In forests between Calôlo and Trombeta ; without either fl. or fr. Feb. 1856. No. **2541**. A beautiful tree, 25 ft. high, with deep glossy green leaves. In the dense forests of Serra de Alto Queta, without either fl. or fr. August 1856. No. **2540**.

The native name of this tree is "Mualâla" both in Loanda and Golungo Alto. No. 2539 was occasionally called also "Dendo," the name of *Diospyros Dendo*. In order to convince himself as to the native name, Welwitsch requested the chief Moncão to send him a Mualâla from Trombeta, and received exactly the same species. According to a ms. note of Welwitsch, the wood of Mualâla, called also "Tacula escura" (dark Tacula) is good for making flutes and other such musical instruments.

2. **M. buxifolia** Pers. Syn. Pl. ii. p. 606 (1807) ; Hiern, *l.c.*

Ebenus buxifolia O. Kuntze, Rev. Gen. Pl. ii. p. 408 (1891).

Var. **Ebenus** Thwaites, Enum. Pl. Zeylan. p. 183 (1860).

Ambriz.—A small tree, 12 to 15 ft. high, with the habit of the family ; branches rather erect ; branchlets crowded, slender, sub-pubescent with thin hairs ; leaves coriaceous, glossy, easily deciduous at the time of the flowering, undulate on the margin ; flowers dicœcious, white or whitish, rather rigid. In the male plant peduncles 3-flowered, rather shorter than the petioles ; flowers when open somewhat nodding ;

calyx 3-lobed, hirsute outside, bracteolate at the pedicel, the lobes broadly ovate and subacute; corolla trifid, strigose-hirsute outside, exceeding the calyx; stamens usually 9, rarely only 3; anthers apiculate; some of the filaments combined at the base, rather shorter than the anthers; ovary rudimentary, pilose. In the female plant calyx-lobes 3, ovate, shortly acute, hirsute with erect hairs; corolla tubular, twice the length of the calyx, trifid half-way; the lobes oblong, obtuse, rather fleshy, erect-spreading; stamens obsolete; ovary ovoid, adpressedly hirsute all over especially at the base, 3 celled; style short, columnar, rather thick, terminating at the apex in 3 very short papilliform stigmas. In the rocky parts of little forests between Ambriz and Quizembo on the right bank of the river Loge, not far from the sea, not abundant; fl. (male and female plants) middle of Nov. 1853. No. **2527**.

4 **DIOSPYROS** Dalech., L.; Benth. & Hook. f. Gen. Pl. ii. p. 665.

1. **D. mespiliformis** Hochst. in Pl. Schimp. Abyss. ii. nn. 655, 1243 (*U. i.* 1842); Alph. DC. in DC. Prodr. viii. p. 672 (1844); Hiern in Oliv. Fl. Trop. Afr. iii. p. 518; Ficalho, Pl. Uteis, p. 213 (1884).

Ambriz.—A tree-like shrub of 6 ft. or a small tree of 12 ft., perhaps in primitive forests a full-sized tree; branches patent; the fresh branchlets ferruginous-tomentose; leaves thinly coriaceous, the young ones membranous, very soft and often dusky red, the adult ones caducous at the time of the flowering; calyx-lobes 3 or 4 or rarely 5 or 6; stamens 8. In wooded rocky and sandy places near Ambriz, on bushy hills between Ambriz and Mossul, and in the more open forests between Ambriz and Quizembo; fl.-bud, very few male fl., and ripe fr. middle of Nov. 1853. No. **2528**.

Golungo Alto, etc.—A tree of moderate size (15 to 25 or 30 ft.) or a handsome tree of 30 to 50 ft in height; trunk nearly straight, 1 to 2½ ft. in diameter; bark rough, much cracked; wood very hard, heavy, white, well adapted for making screws; branches erect-spreading; twigs virgate; leaves coriaceous, evergreen or caducous at the time of the flowering; corolla contorted in æstivation; fruit baccate, rather hard, of the size of a small cherry, received at the base in the quadrifid calyx, greenish or olive-tawny when quite ripe, shining, sparingly pulpy inside, 3- or 4-celled; the pulp gummy, very viscid; the cells 1-seeded. In forests, especially in those less dense and sandy, throughout this district and the neighbouring ones of Zenza do Golungo, Cazengo, and Ambaca; at the banks of the river Delamboa in Sobato de Bumbo; foliage without fl. March 1855; Trombata, March 1855, fl. 1856, and without fl. Feb.; at the outskirts of the forests of the Mongôlo mountains, near the river Chixi, in Zenza do Golungo; fr. Sept. 1857. Called by the colonists "Silviera" or "Musolveira" and by the negroes "Mulende." No. **2529**. At Trombeta; fr. June 1855. Coll. Carp. 706. A leafy shrub of 5 to 7 ft. (perhaps in the primitive forests a tree); leaves caducous; flowers white-greenish, small; berries black-purple, 7- to 8-seeded, borne on a quadrifid calyx; fr. N-delle, July 1856 and August 1857. Coll. Carp. 707 and 708.

Ambaca.—A shrublet, 2 to 3 ft. high, branched from the base; leaves membranous, deciduous; fruit orange-yellow, baccate, as large as a moderate-sized cherry, 2- to 6-seeded, with a viscid pulp, borne on a quadrifid calyx. At Isange; fr. 10 June 1857. Coll. Carp. 709.

Bumbo and Huilla.—A bush, perhaps a young tree. In the more open forests from the base of Serra da Xella, above Bruco to Mumpulla ; fl.-bud and fr. Oct. 1859. No. **2530**.

This plant is mentioned by Welwitsch in Apont. p. 552 under n. 108, and is probably the *Diospyros* spoken of in Journ. Linn. Soc. ix. pp. 287, 300 (1866), as a constituent of forest in Ambriz, etc., and as occurring by the copal-field near Mongôlo in the forest composed chiefly of *Cynometra laxiflora* Benth. The fungus n. 208, *Ecidium Diospyri* A. L. Sm., grew on the leaves of this species near Trombeta.

2. **D. platyphylla** Welw. ex Hiern Monogr. Eben. in Trans. Cambr. Phil. Soc. xii. p. 266 (1873), and in Oliv. Fl. Trop. Afr. iii. p. 519.

Pungo Andongo.—A tree of moderate size ; branches lax, tortuous, leafy at the apex ; fruit said to be edible. In the more open sandy Panda forests from Calunda to Condo ; scarcely in good fl. March 1857. Local name "Musolveira," the same as that of *D. mespiliformis* Hochst. No. **2531**. A shrub, 1½ to 2 ft. high ; perhaps the upgrowth from an old tree ; rootstock large, very hard ; stems numerous, erect, compressed-angular ; leaves rigidly coriaceous, shining, with raised veinlets beneath ; fruit solitary, axillary, hirsute, apparently baccate, received into the 4- or 5-cleft calyx, apiculate at the apex with the remains of the style. In the sandy *Panda* forests between Zamba and Cazella, sporadic ; young fr. 18 Oct. 1856. Apparently this species. No. **1234**. An undershrub or shrublet, 1½ ft. high, rigid. In the sandy forests between Cazella and the præsidium, rather rare ; after the fall of the fl., Nov. 1856. Perhaps this species. No. **1242**.

The fungus n. 211 grew on this species between Calunda and Condo.

3. **D. Loureiriana** G. Don, Gen. Syst. iv. p. 39 (1837) ; Hiern in Oliv. Fl. Trop. Afr. iii. p. 522 ; Ficalho, Pl. Uteis, p. 214 (1884).

Var. **heterotricha** Welw. ex Hiern in Journ. Bot. xiii. p. 355 (1875), and in Oliv. *l.c.*, p. 523.

Golungo Alto, Ambaca, etc.—An erect shrub, 2 to 8 ft. high ; stems several ; branches patent ; branchlets and young leaves clothed with hairs of two kinds ; leaves membranous, usually flaccid, very readily falling off in the drying ; flowers dicœcious or at least polygamous ; calyx quadrangular at the base, 4-cleft from the middle upwards, valvate in flower, green ; corolla milk-white, perigynous, gamopetalous, deeply 4-lobed, the lobes contorted in æstivation ; stamens 8, adnate to the base of the corolla, densely bearded with rather rigid hairs ; ovary spherical, crowned with 4 styles falling short of the corolla ; fruit 8-seeded, said to be edible. In bushy places and at the outskirts of forests throughout this and neighbouring districts, especially in wooded mountainous places, and frequently alongside high roads, fl. from Sept. to May 1854 to 1856 ; among the Queta mountains, 28 Feb. 1855 ; in the shady woods of Sobato de Mussengue, March 1855 ; in hilly thickets on a red muddy soil, from Izanga towards N-gombe (in Ambaca), in company with *Bauhinia cissoides* Welw. (herb. No. 552 ; *ante* p. 295) and *Smilax Kraussiana* Meisn. (Welw. herb. No. 3860), fl. 16 and 17 Oct. 1856. No. **2535**. Branches erect-spreading ; leaves deciduous ; flowers polygamous ; corolla deeply 4-partite, white ; style bipartite at the apex. In the more open woods of Sobato de Bumba near Bumba, fl. Sept. 1855 ; in shady forests among the Queta mountains, fl. 24 Sept. 1856. A narrow-leaved spring form ; also at the cataracts of the Delamboa, fr. May 1855. No. **2535***b*.

The natives call this plant "Dendo ofele," or "Dendo cafeli," that is, small *Dendo*.

4. **D. Dendo** Welw. ex Hiern, Monogr. Eben. p. 195, t. x (1873), and in Oliv., *l.c.*; Ficalho, Pl. Uteis, p. 214 (1884).

Golungo Alto.—An evergreen tree, 25 to 35 ft. high; wood very hard, quite black in the centre; leaves shining, green; berries black-purple. Among the mountains of Serra de Alto Queta, Dembos, etc., plentiful, in dense primitive forests which this plant occasionally forms together with Anonaceæ (cf. *Unona lucidula* Oliv.; Welw. herb. Nos. 758, 767) and *Corynanthe paniculata* Welw. herb. No. 1508; fl. Dec. to Feb., fr. March to May 1854 to 1856. No. **2537**. In the dense most elevated forests of Cungulungulo; without either fl. or fr. Feb. 1855. Apparently a broad-leaved form of this species. No. **2538**. The Dendo grande of the Mangue forest in Queta; fr. April 1856. Coll. Carp. 710.

This tree, which is called "Dendo" or "N-Dendo" by the natives in Golungo Alto, is mentioned by Welwitsch, Apont. p. 552 under n. 108, as a *Diospyros* which furnishes very beautiful and durable timber for building purposes. He also describes it, Synopse Explic. p. 10, n. 18, as follows:—A tree of 25 to 40 ft. in height and 1 to 2 ft. in diameter, growing in the densest and most shady virgin forests; the wood is one of the strongest, densest, compact, and most durable in the forests of Angola; it is white in the outer part, with black bars in the middle of the trunk.

It is the Dendo grande, or great Dendo, as contrasted with the Dendo ofele, or small Dendo, which is *D. Loureiriana* G. Don, *β. heterotricha*. The name Dendo is also occasionally used for *Maba Mualala* Welw.

5. **D. Welwitschii** Hiern, sp. n.

A shrub or tree; branches dusky, glabrate, terete; branchlets alternate, slender, dusky-ashy, making an angle of about 45° with the branches, ascending, minutely puberulous at the extremities; leaves alternate, oval or oblong, obtusely sub-acuminate at the apex, more or less obtusely narrowed at the base, thinly coriaceous, shining dark green and glabrous or very nearly so above, rather paler green subglabrate and microscopically scaly beneath, $1\frac{3}{4}$ to $3\frac{1}{2}$ in. long by $\frac{2}{3}$ to $1\frac{1}{3}$ in. broad; midrib narrowly depressed above, in relief beneath; lateral veins and net-veins inconspicuous; margin entire, rather undulate; petiole $\frac{1}{8}$ to $\frac{1}{4}$ in. long, glabrate or puberulous; male flowers fasciculate a few together, clustered in very abbreviated axillary puberulous cymes, rather fleshy, milk-white, very readily falling off, glabrous; calyx $\frac{1}{8}$ in. in diameter, 4-cleft, the lobes broadly deltoid, obtuse; corolla deeply 4- or rarely 5-lobed, $\frac{1}{6}$ in. long, the segments oval-ovate, obtuse; stamens about 16, glabrous, inserted on the corolla near its base or near the top of its very short tube; anthers ovate-lanceolate, about $1\frac{1}{2}$ in. long or rather less, longer than the rather slender filaments; ovary rudimentary, glabrous, obtuse.

Loanda.—At Alto das Cruzes, Feb. 1854. No. **4840** In bushy places near Museque do Senhor Schut, rather rare; male fl. 17 May 1854. No. **4841**.

This is nearly related to *D. Dendo* Welw., but the corolla is much shorter and the foliage more coriaceous.

The doubtful Ebenacea, mentioned in Fl. Trop. Afr. iii. p. 525, is possibly an Anonacea, and, if so, should have appeared *ante* on page 9, as follows:—

2*. **POLYALTHIA** Blume; Benth. & Hook. f. Gen. Pl. i. p. 25.

1. **P. ? acuminata** Oliv. Fl. Trop. Afr. i. p. 26; Henriques, Bol. Soc. Brot. x. p. 98 (1892).

Island of St. Thomas.—A handsome, evergreen tree; trunk strictly erect, 2 ft. in diameter; wood very hard, dusky-blackish. In the more elevated primitive forests of Monte Caffé, not uncommon; without either fl. or fr. end of Dec. 1860. Colonial name "Preto" or "Páo Preto." No. **2536**.

Henriques, *l.c.*, identifies, but with some doubt, a plant from St. Thomas bearing the local name of "Páo preto" with Oliver's species; but Welwitsch's No. is not unlike Ebenaceæ in habit.

LXXX. OLEACEÆ.

1. **JASMINUM** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. p. 674.

1. **J. microphyllum** Baker in Kew Bull. 1895, p. 93 (June 1895).

Huilla.—A slender little shrub, sometimes standing erect, sometimes more or less twining; flowers whitish with a purplish tinge. In the drier thickets composed of *Duranta erecta* L. (Welw. herb. No. 5760), and *Clerodendron* (cf. Welw. herb. Nos. 5763, 5768), on the right bank of the Lopollo river, rather rare; fl. Feb. 1860. No. **932**.

2. **J. ternum** Knobl. in Engl. Bot. Jahrb. xvii. p. 535 (1893).
J. brevipes Baker, *l.c.*

Golungo Alto.—A robust shrub, climbing far and widely; flowers fragrant, white inside, rosy-purple outside; drupes black; in the Mangue forests among the mountains of Alto Queta, abundant; fl. and fr. March 1856; fr. May 1856. A subscandent shrub, with white flowers; in shady moist tall thickets between Ponte de Luiz Simões and Camilungo; fl. beginning of July 1856. No. **926**.

Ambaca.—A sarmentose shrub of 4 to 6 ft.; leaves coriaceous, deciduous at the time of the inflorescence; flowers very pleasantly fragant, handsome, rather fleshy, white inside, bright purplish outside. In wooded thickets from Izanga towards N-gombe, sporadic; fl. Oct. 1856. No. **929**.

3. **J. obovatum** Baker, *l.c.*, p. 94.

Pungo Andongo.—A widely climbing shrub; branches and branchlets slender, flexuous, as well as the soft membranous leaves shaggy with spreading hairs; flower-buds whitish, turning somewhat yellowish. By thickets near Catete, in deep rocky valleys; fl.-bud beginning of Dec. 1856. No. **5934**. A shrub climbing far and widely; flowers very fragrant, white with a rosy tinge. In the moist rocky thickets of Barrancos de Catete, near the præsidium, sporadic; fl. Feb. 1857. No. **923**.

Var. **Welwitschii**. Branches less densely pubescent.
J. Welwitschii Baker, *l.c.*

Golungo Alto.—A climbing shrub. Among the Queta mountains; fl.-bud Feb. Nos. **5933***a*, **5933***b*, **5933***c*.

Pungo Andongo.—A shrub, climbing high and very widely; leaves subcoriaceous, but little shining; flowers very agreeably fragrant, white, present during nearly the whole year; corolla-limb 7- to 9-cleft. In wooded rocky thickets at the outskirts of forests near the præsidium; fl. middle of Dec. 1856. No. **927**.

The distinction between the two species here brought together, which is alleged to exist in the comparative length of the calyx-tube with its lobes, does not always hold good. Both are very closely related to *J. pauciflorum* Benth. in Hook. Niger Fl. p. 443 (1849), perhaps too closely for specific separation.

4. **J. longipes** Baker, *l.c.* (*longpipes*).

Golungo Alto.—A slender shrub, climbing widely, with long sarmentose branches; flowers slightly fragrant, red-purple outside, milkwhite inside; in bushy places at the outskirts of the primitive forests of Alto Queta, about Sange, plentiful: fl. end of Dec. 1855. A shrublet with subscandent sarmentose branches and flowers (judging from the buds) apparently whitish; in Sobato de Bumba at the river Cate, only one specimen, in unopened fl. Dec. 1854. No. **925**.

5. **J. angolense** Welw. ex Baker, *l.c.*, p. 95.

Loanda.—A shrub, 2 to 3 ft. high, altogether erect (or in one case only a sarmentose branch was seen), with numerous stems much branched from a woody rootstock; very beautiful by reason of the plentiful two-coloured flowers; leaves simple, thinly fleshy, scarcely coriaceous, bright and deep green; flowers comparatively large, very crowded; corolla milkwhite inside, purplish or usually deep purple outside. On sandy rather dry hilly spaces by scattered bushes of *Maerua angolensis* DC. above Loanda, not seen elsewhere, plentiful; fl. and fr. Feb. and April 1854. No. **924**. An erect shrub, 3 to 4 ft. high; branches twisted; flowers scarcely at all fragrant, violet-red outside, snow-white inside; style elongated, with an oblong somewhat bilobed stigma. In bushy places; fl. Nov. 1853 and March 1854. A form with leaves more acuminate than in the type and growing in company with it. No. **924***b*.

6. **J. mauritianum** Boj. Hort. Maurit. p. 204 (1837); DC. Prodr. viii. p. 310 (1844).

J. tettense Klotzsch in Peters, Mossamb. Bot. (i.), p. 284 (1861); Henriques, Bol. Soc. Brot. x. p. 139 (1892).

Loanda.—A high-climbing shrub; leaves compound; veins of the leaflets constantly bearded in their lower axils; flowers very fragrant, with the aroma nearly of *J. Sambac* Ait. In thickets and in plantations of *Adansonia digitata* B. Juss., tolerably frequent but not penetrating into the interior of the country; fl. and fr. from Feb. to May 1854. No. **923**.

Mossamedes.—Flowers white, strongly and very sweetly fragrant. In dry places among shrubs near the river Girául, very sparingly; fl. July 1859. No. **930**.

Huilla.—Flowers white, fragrant. In bushy rocky places between Mumpulla and Nene, sporadic; fl. and young fr. Oct. 1859. No. **931**.

7. **J. mossamedense** Hiern, sp. n.

A handsome, glabrous, rather shining shrub, 8 to 12 ft. high, virgately branched from the base; stems numerous, erect, subterete; branchlets elongated, weak, slender, nodding, obtusely

angular, sulcate; leaves opposite, imparipinnate, 1- to 3-jugate, $1\frac{1}{2}$ to 2 in. long, exstipulate; leaflets oval-oblong, rounded or emarginate at the apex, somewhat wedge-shaped at the base, the lateral ones unequally so, firmly membranous, of nearly the same colour and subglaucescent on both faces, very narrowly revolute and entire on the margin, the terminal one $\frac{1}{2}$ to 1 in. long by $\frac{1}{6}$ to $\frac{1}{2}$ in. broad, the lateral ones smaller than the terminal one; common petiole $\frac{1}{4}$ to $\frac{1}{3}$ in. long; petiolules very short; inflorescence axillary.

Mossamedes.—In a bushy sandy place by the bank of the river Maiombo, near Pomangala; seen nowhere else; without fl. in Oct. 1859, with very young fl.-bud in June 1860. No. **3022**.

This species has apparently not hitherto been described; it belongs to the section Pinnatifolia, DC., and is near *J. floribundum* Br.

2. **NATHUSIA** Hochst. in Herb. Schimp. Abyss. i. n. 245 (*U.i.* 1840) & in Flora xxiv. p. 671 (14 Nov. 1841).

Schrebera Roxb. (1798); Benth. & Hook. f. Gen. Pl. ii. p. 675; non L. apud Schreb. (1773).

1. **N. alata** Hochst., *l.c.*, p. 672; Welw. Apontam. p. 579 under Nota 10 (1859).

Schrebera Saundersiæ Harv. Thes. cap. ii. p. 40, t. 163 (1864). *S. alata* Welw. in Trans. Linn. Soc. xxvii. p. 41 (1869).

Pungo Andongo.—A tree, 20 to 25 ft. high, precisely like an ash in habit; trunk a foot in diameter at the base; leaflets deep green, rather fleshy, scarcely coriaceous; flowers with the scent of *Philadelphus coronarius* L.; calyx puberulous or somewhat shaggy; corolla straw-coloured; the lobes of the limb mostly 6, patent, bearded at the base with hairs of a deep cinnamon colour more or less tinged with violet; the tube scattered inside with thin dusky hairs; stamens inserted a little below the throat, included or sub-exserted; filaments very short; anthers apiculate at the apex with an empty appendage; style filiform, exserted; stigma thick, sub-bilobed; the lobes contiguous, fuscous-stigmatose on the inner side. In little rocky woods intersected with numerous rivulets, on the south-west of the præsidium, tolerably plentiful; fl. Oct. 1856. No. **937**. Leaves pinnate. In Mata de Pungo; fr. beginning of May 1857. Coll. Carp. 713.

Huilla.—A small tree, 8 to 15 ft. high, but always with a single trunk, with the aspect of the European Ash; leaves imparipinnate, coriaceous, glossy, with the rhachis winged; flowers very fragrant especially by night; corolla salver-shaped, like a jessamine, 5- to 8-cleft; the tube scattered inside either throughout or only at the base with rather crisp hairs; stamens 2, inserted a quarter or a third way down the tube; anthers oblong, ellipsoidal, obtuse at both ends, sub-emarginate at the base, inserted at the middle of the back, included; the connective broad, flattened, laterally 2-celled; ovary obconical, sub-truncate at the apex, 2-celled; the cells 4-ovuled; style flaccid; stigma thickened-clavate, with 2 rather obtuse and usually cohering lobes; capsule pyriform, much compressed at the apex, bi-partite; the valves obcordate, emarginate, woody. In rather elevated (5000 ft.) much mixed forests in Morro de Lopollo; fl. Dec. 1859 and Jan. 1860; young fr. May 1860. No. **938**. Leaves pinnate. Fr. Jan. 1860. Coll. Carp. 714.

Abyssinia.—A tree. In valleys near Gennia, Memsach; fl. and fr. 14 Dec. 1837. *Schimper*, i. n. 245.

Var. *β.* **tomentella** (Welw. in Trans. Linn. Soc., *l.c.*, p. 42).

Huilla.—An arborescent shrub of 5 to 8 ft. or almost a small tree, very hard, with patent brittle branches, ash-like foliage, and very fragrant jessamine-scented whitish sordid-purplish flowers. In the rocky more elevated drier parts of Morro de Lopollo, at an elevation of 5200 to 5500 ft.; fl. and young fr. end of March 1860. A form with the branchlets, leaves, peduncles, and pedicels silky-tomentellous. No. **939**.

2. **N. golungensis** O. Kuntze, Rev. Gen. Pl. ii. p. 412 (1891). *Schrebera golungensis* Welw., *l.c.*, p. 40, t. xv.

Golungo Alto.—A handsome tree, 15 to 30 ft. high; trunk $\frac{3}{4}$ to 2 ft. in diameter at the base; branches erect-spreading or spreading; flowering branchlets somewhat nodding; leaves evergreen or deciduous, moderately coriaceous, shining; flowers very sweetly fragrant especially by night; calyx shortly campanulate, green, fleshy, shortly 4- to 6-toothed, often quasi-truncate, the teeth very delicately fringed; corolla salver-shaped, inserted at the bottom of the calyx-tube; the limb constantly 6-cleft; the segments obovate, densely beset within from the base to the middle with red papillæ, patent at the time of full flowering; the whole corolla soon tinged with a cinnamon colour and in this state emitting a clove-like aroma; stamens included or sub-exserted; anthers ellipsoidal-obovoid, attached about the middle of the back; ovary free; ovules 3 or 4 in each cell; style elongated; cotyledons oblong, rather fleshy, flat, not longitudinally folded; radicle tolerably conspicuous, obtuse, directed towards the hile. In elevated primitive forests among the mountains of Serra de Alto Queta, here and there; fl. Dec. 1855; fr. May 1856. No. **933** and Coll. Carp. 711.

3. **N. trichoclada** O. Kuntze, *l.c.*

Schrebera trichoclada Welw., *l.c.*, p. 41. *Nathusia* foliis indivisis, Welw. in Journ. Linn. Soc. iii. p. 153 (Feb. 1859).

Ambaca.—A robust shrub, with the habit somewhat of *Salix caprea* L., perhaps at length arborescent; leaves very readily falling off in the course of drying, those at the ends of the branchlets larger and acute, those at their base smaller and very obtuse, flowers very pleasantly fragrant. In rocky mountainous places among tall bushes at the great cave of Puri-Cacarambola, rather rare; fl. end of Oct. 1856. No. **934**.

Pungo Andongo.—An arborescent shrub, 8 to 10 ft. high; branches patent. In the sandy Panda forests between the river Lutete and the præsidium, very sporadic and rather rare; fl. Oct. 1856; fr. June 1857. A form with the leaves and calyces sparingly hairy but the flowering branches hoary-tomentellous as in the type; the leaves shorter and broader, obovate-elliptical and more compact. No. **935**. A small tree, 15 ft. high or rarely more, or sometimes a bush of 8 to 12 ft.; trunk straight, patently branched above; wood used for making domestic utensils; leaves hard-membranous, deciduous; stamens 2, inserted on the corolla-tube a quarter below its throat, included; filaments rather broad, compressed; anthers linear-oblong, very obtuse at both ends; ovary nearly glabrous; style glabrous, cylindrical, central, straight; stigma clavate, obtuse at the apex, more or less deeply bilaminate, viscid; capsule pyramidal, acuminate. In thin sandy forests between

Cazella and the præsidium, and also but rarely in the præsidium itself; fl. Dec. 1856; fr. June 1857. No. **936**. Near Luxillo, by the road leading to Cazella; fr. June 1857. Coll. Carp. 712.

This and the last, as well as the other species above mentioned, were recommended for introduction into Portugal: see Welwitsch, Apontam. p. 579, note 10.

3. **MAYEPEA** Aubl. Pl. Guian. i. p. 81, t. 31 (1775).

Linociera Swartz (1791); Benth. & Hook. f. Gen. Pl. ii. p. 678.

The type specimen of *Mayepea* is in the British Museum herbarium.

1. **M. africana** Knobl. in Engl. Bot. Jahrb. xvii. p. 529 (1893).

Chionanthus africanus Welw. ex Knobl., *l.c.*, p. 530.

Pungo Andongo.—A tree, 20 to 30 ft. high, with the habit of *Olea latifolia* and nearly like that of *Linociera intermedia* Wight, Ic. t. 1245, but differing by the panicles of flowers being shorter than the leaves, the strigulose-hirsute calyces, the pale yellow instead of white corolla, the narrower strictly erect petals, and the rounded obtuse instead of acute leaf-tips; bark whitish; trunk 1 to 1½ ft. in diameter at the base; branches patent, more or less smooth-whitish, as well as the branchlets dilated-tumid at the nodes; leaves coriaceous, glossy and deep green above, pallid beneath; petals thick; stamens 2. In little woods, the remnants of the primitive forest, at the base of the gigantic rocks of the præsidium, sporadic; fl. and few fr. Dec. 1856; Mata de Pungo and Cabondo; fr. Feb. 1857. No. **941**.

This is the plant referred to by Welwitsch, Apontam. p. 549, under n. 89, and p. 579, note 10, as belonging to an undescribed genus.

2. **M. Welwitschii** Knobl., *l.c.*, p. 530.

Golungo Alto.—A tall tree, 50 to 80 or 100 ft. high or more; trunk 2 to 3 ft. in diameter at the base, bare of branches half way up, then with numerous primary suberect branches; the secondary branches and branchlets patent or even nodding and pendulous, arranged irregularly; branchlets much compressed and flattened towards the insertion of the leaves; leaves opposite, thinly chartaceous-coriaceous, bright green and glossy above, but little paler beneath, smooth on both faces, borne on variously curved or reflected long flaccid petioles and therefore pendulous, apparently evergreen; flowers arranged in terminal trichotomous panicles; pedicels and common peduncles quadrangular; calyx shortly cyathiform-campanulate, 4-toothed, green, bracteate at the base; bracts ovate-lanceolate, furfuraceous; corolla white, gamopetalous, hypogynous, some deciduous after fertilisation of the ovary; the tube very short; the limb equal, quadrifid; the lobes valvate in æstivation; stamens 4, inserted on the throat of the corolla, exserted, equal; anthers yellow, introrse, large, 2-celled; the cells distant, dehiscing longitudinally; style terminal, short, robust, whitish-green; stigma thick, cubical-capitate. In the denser primitive forests, by the cataract of the river Cuango, near Sange, sporadic; fl. Aug., young fr. Oct. 1855. No. **945**. A small, probably a young tree, 6 ft. high, agreeing in habit with the previous No. but with much shorter petioles; without either fl. or fr., at the cascade of the Cuango, April 1855. Probably a young state of this species. No. **946**.

4. **OLEA** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. p. 679.

1. **O. europæa** L. Sp. Pl. edit. 1, p. 8 (1753).

Var. *β.* **sativa** DC. Prodr. viii. p. 284 (1844).

Loanda.—A small tree, 8 to 10 ft. high. In sandy maritime places in the island of Cazanga near Loanda, introduced from Portugal and several trees cultivated; without either fl. or fr. May 1854. No. **940**.

It was reported to Welwitsch that this tree flowered abundantly in Benguella gardens, but that it never or only once had borne fruit there; in Apontam. p. 549, under n. 89, he recommended its cultivation in the district of Pungo Andongo.

LXXXI. SALVADORACEÆ.

1. **SALVADORA** Garcin, L.; Benth. & Hook. f. Gen. Pl. ii. p. 681.

1. **S. persica** L. Sp. Pl. edit. 1, p. 122 (1753).

Var. **densiflora** (Welw. ms. in Herb.).

A perennial shrub, 4 to 6 ft. high, of a sad pallid almost Chenopodiaceous aspect, much and densely branched; sap watery; stem scarcely jointed; branchlets virgate, divergent-nodding, green compressed-angular and pubescent towards the extremities; leaves opposite, oval, rounded or obtuse at the apex, obtuse or obliquely narrowed towards the base, coriaceous, glabrous or nearly so, evergreen, pallid-glaucous, entire and in the dry state rather undulate on the margin, 1 to 2 in. long by $\frac{1}{2}$ to 1 in. broad; petiole $\frac{1}{8}$ to $\frac{1}{6}$ in. long; flowers hermaphrodite, greenish, tetramerous, $\frac{1}{12}$ in. in diameter, on very short puberulous pedicels, densely paniculate; calyx deeply quadridentate, rather fleshy; corolla quadrifid, longer than the calyx; the lobes somewhat imbricate in æstivation, revolute at the time of full flowering, thinly membranous, whitish-greenish; stamens 4, alternating with the corolla-lobes, filaments flattened, ascending; anthers globose, didymous, introrse, 2-celled, longitudinally dehiscing, yellow; ovary comparatively large, spherical, green, sessile at the bottom of the calyx-tube, covering the insertion of the corolla-lobes and stamens, 1-celled, 1-ovulate; disk obsolete; berry soft, rosy, as large as a peppercorn, hyaline-pulpy inside, 1-seeded.

Loanda, etc.—In sandy maritime rocky places, very plentiful along the coast from Ambriz to the mouth of the Cuanza; near Loanda, fl. and fr. Nov. 1853 and Oct. 1857. No. **944**.

2. **AZIMA** Lam. (1783); Benth. & Hook. f. Gen. Pl. ii. p. 681.
Monetia L'Hérit. Stirpes Novæ, p. 1, t. 1 (1784).

1. **A. tetracantha** Lam. Encycl. Méth. i. p. 343 (1783).
Monetia barlerioides L'Hérit., *l.c.*

Loanda.—An erect, much-branched shrub, 3 or rarely 4 ft. high, bristling with very acute axillary spines; leaves coriaceous, glossy, evergreen; flowers greenish-yellowish; fruit white. In sandy and rocky bushy maritime hilly places along the whole coast of the district, plentiful; fl. in April, fr. from March to August; near Maianga d'El Rei, fl. beginning of April 1854. Nos. **942**, **4649**, **5403**. A coast shrub; leaves fleshy, brittle; spines cruciate; flowers Rhamnoid, green; berries crowded, black, juicy; Praia de Penedo; fr. Jan. 1854. Coll. Carp. 336.

Icolo e Bengo.—In rather dry thinly bushy places near Dafunda, rather sparingly; fl. Sept. 1857. A broad-leaved form of this species. No. **943**.

LXXXII. APOCYNACEÆ.

Rubber-yielding plants appear to be abundant in Angola, although the quantity of rubber exported in Welwitsch's time was very scanty, and in some cases had been even restricted to single samples; he, however, was fully convinced that the smallness of the export of an article in such great demand in European markets was by no means to be attributed to the rarity of these plants in the country, but principally to the immense variety and quantity of several other colonial products, such as ivory, wax, gum copal, palm oil, coffee, etc., on which both the native collectors and the local dealers derive a much larger profit. Moreover, the negroes of tropical Africa are very imperfectly acquainted with or totally ignore the superior methods and manipulations employed in America and the East Indies. According to Welwitsch's observations and investigations made in Angola, the trees and shrubs from which indiarubber is collected, besides some large-leaved species of *Ficus*, are several species of *Pacouria*, the latter forming large climbing shrubs, 50 to 80 feet high, with stems not rarely attaining 6 to 8 in. in diameter, when growing undisturbed in the primæval forest and spreading out their branches like a verdant carpet over the tops of the larger trees. A species also of *Pleiocarpa*, growing in the less dense forests of the interior, yields a rather valuable kind of rubber, though only in small quantity on account of the tree rarely attaining much size and its sap not being so milky as that in *Pacouria*. All the species of *Pacouria* observed by Welwitsch produce edible fruits, those of *P. florida* being the most appreciated by the natives and called by them "Diluti," a name which they also apply to the shrub itself, while *P. owariensis* as well as the rubber extracted from it they call "Licongue." The method which Welwitsch saw employed in some of the highland districts by the Licongue collectors was very rude and imperfect; by the imperfection of the method of extraction, not only the quantity of the product must have been considerably reduced but also the quality of the article obtained was much inferior to what could be collected by a more appropriate and scientific process; it is, therefore, not surprising that the rubber did not fetch a sufficiently remunerative price in the markets on the coast to encourage the natives and dealers to devote themselves to the collection and marketing of this valuable commodity.

1. **PACOURIA** Aubl. Hist. Pl. Guian. i. p. 268, t. 105 (1775).

Alstonia Scop. Introd. p. 198 (1777), non Br. (1809). *Vahea* Lam. Encycl. Méth. tab. 169 (1797 ?). *Landolphia* P. Beauv. Fl. Owar. i. p. 54, t. 34 (1806 ?); Benth. & Hook. f. Gen. Pl. ii. p. 692.

The type of Aublet's genus is in the British Museum herbarium.

1. **P. owariensis.**

Landolphia owariensis P. Beauv. Fl. Owar. i. p. 55, t. 34 (1806 ?); Ficalho, Pl. Uteis, p. 214 (1884); *Vahea owariensis* F. Muell. Extra-trop. Pl. Indian ed. 1880, p. 344.

Golungo Alto.—An evergreen, arborescent shrub, climbing to a great height, milky in all its parts with a very viscid and tenacious whitish juice which quickly coagulates into an elastic gum called by the Muhungo negroes "Licongue" (singular) or "Macongue" (plural); trunk 3 to 6 in. thick in the primitive forests, but in secondary woods only 2 to 3 in.; bark of the stem, branches, and branchlets black; branches opposite or pseudo-ternately verticillate, patent; branchlets not uncommonly and even the peduncles transformed into woody very tenacious tendrils; leaves rigidly coriaceous, penninerved, very closely venulose between the nerves, bright green, paler beneath, glossy on both faces, varying in shape according to the age of the plant, sometimes 8 in. long, mostly 4 to 5 in. long, pendulous on the branchlets; petiole amplexicaul-sheathing at the base, the sheath beset with very small interpetiolar teeth or scales; flowers yellowish, cymulose-paniculate, slightly fragrant, terminal, densely clustered, met with during nearly the whole year and thus not rarely accompanied by ripe fruits on the same shrub; calyx rather fleshy, elongate-obovate, 5-cleft, tomentose with a cinnamon-coloured or dusky felt; the lobes ovate, obtuse, ciliate-fimbriate, imbricate in æstivation and at the time of the flower with the sides imbricate; corolla when fresh whitish-reddish, turning soon to a cinnamon-orange colour, hypogynous, salver-shaped; the tube twice as long as the calyx, pale brown below, a little dilated or thickened and cinnamon-felted about the middle, dusky-reddish above and on the rather fleshy rigid soon reflected lobes of the limb, smooth and naked inside but white-pilose at the throat; stamens 5, inserted a little below the corolla-throat; filaments pilose, very short, anthers yellow, included, sagittate, glabrous, not appendaged, 2-celled, dehiscing longitudinally; ovary sessile, obovoid, unilocular, pluri-ovulate, crowned at the apex with an elevated densely papillose ring of deep-red crisp glandular hairs; style central, cylindrical, straight, glabrous, rather compressed, as high as or falling short of the stamens; stigma angular-capitate, greenish, thick, ovoid-conical, obtuse, somewhat bilobed; berry like an orange in size and shape but ellipsoidal, pseudo-bilocular, scrobiculate-tuberculate outside, with a rather hard skin and numerous oblong-ovoid red-brownish seeds imbedded in an acidulous-sweet pleasant edible viscid pulp of a white-yellowish colour. In the primitive forests of Sobato Mussengue, Quilombo, Queta and Bumba, in the mountainous parts of Alto Queta, in palm groves, etc., sporadic; fl. March and April 1855 and Oct. 1855; fl. and fr. June 1856; ripe fr. March and April 1856. No. 5930 and Coll. Carp. 716. Seeds, July 1857; probably this species. Coll. Carp. 726.

Welwitsch in his notes states that he had seen the negroes collecting indiarubber from this species in the districts of Golungo Alto and Cazengo, where it is by no means rare in the primæval forests, and under favourable circumstances develops a stem of 4 to 7 in. in diameter at a height of 2 to 3 ft. above the ground, and then divides into several thinner very elongated branches which are subdivided into numerous smaller opposite branchlets and climb along the stems and longer branches of neighbouring trees, attaching themselves by means of very tenacious spirally twisting tendrils formed of the indurated flowered stalks after the fall of the ripe fruit. The older branches are quite glabrous and of a blackish brown colour, though

the younger twigs and also the fresh leaves are covered with a silky pubescence which in the course of drying turns rusty-brown; the leaves are opposite and when fully grown become rather coriaceous, oblong or elliptic-oblong, more or less acuminate at the apex, somewhat attenuate but sub-obtuse at the base, quite entire, 2½ to 7 in. long by 1 to 3 in. broad, distantly penninerved, shining and densely reticulate on both faces; petioles slightly pubescent, channelled, ⅛ to ½ in. long; inflorescence terminal, much branched, many flowered, corymbose, at first very dense; peduncle at first very short, afterwards elongating and reaching 2 to 3 in. long. With the exception of the corolla, which is quite glabrous outside and at first white, but very soon changes to a dusky red tint, the whole of the inflorescence is covered with a ferruginous or nearly cinnamon-coloured pubescence, which, however, gradually disappears from the fruiting peduncles so as to be scarcely discernible on them when they ultimately become transformed into spirally twisted tendrils. The fruit of this species, as well as those of *P. florida* and *P. crassifolia*, is of the shape of a middle-sized orange but rather pyriform, and when quite ripe is covered outside with thick wrinkles and contains, under its hard almost woody reddish-brown skin, a sweet slightly acid pulp with numerous bean-like seeds; the copious horny albumen of the seeds splits into two nearly equal halves, showing in the centre the erect embryo with its ample membranous oblong very obtuse cotyledons of the same length as the albumen and with its short turgid nearly obtuse radicle.

Welwitsch reported that this plant is frequently met with in Sobato de Quilombo-Quiacatubia situate on the frontier of the district of the Dembos, and also in several of the highland districts of the interior; he gave its geographical range as extending from 10° N. lat. to 10° S. lat. in Western Africa. The natives of Golungo Alto bring at times small quantities of the elastic gum to the markets on the coast. See Welwitsch, Synopse Explic. p. 50, n. 134.

2. **P. florida.**

Landolphia florida Benth. in Hook. Niger Fl. p. 444 (1849); Ficalho, Pl. Uteis, p. 216 (1884). *L. comorensis* (Boj.) var. *florida* K. Schum. in Engl. Bot. Jahrb. xv. p. 404.

Golungo Alto and Cazengo.—A robust shrub, climbing to the tops of the loftiest trees and then near Cambondo flowering in company with a species of *Combretum* (cf. *C. paniculatum* Vent. and *C. angolense* Welw.; herb. Nos. 4363, 4323); stem milky; leaves coriaceous, rigid, thining above, elliptical or oblong, large (6 to 7 in. long by 2 to 3 in. broad); flowers terminal and axillary, corymbose, white, very fragrant, handsome; corolla-tube not always pilose inside above; corolla-lobes thinly pubescent on both faces, this pubescence in some flowers extending within the throat; anthers oblong-linear, obtuse at the apex, emarginate at the base, attached at the back to the filament a little above the emargination; style firm, strictly erect, gradually narrowed from the broader base, scarcely filiform; fruit baccate, oblong-ovoid, as large as a man's fist (3½ in. in vertical diameter, 2 to 2½ in. in transverse diameter), aromatic, milky, edible, agreeably acidulous, the skin rugose, verrucose-scrobiculate, orange-coloured when ripe; the milk soon coagulating into an elastic gum. At Sange; fl. and fr. Feb. 1855. At the margins of forests among the mountains of Alto Queta and near Cambondo, sporadic; fl. Dec. 1854, fr. June 1855. At Quibolo, fl. Aug. 1856. Negro name "Matuti," "Dituti," or "Rituti." No. **5929** and Coll. Carp. 715.

The fruit of this is the most appreciated of all the species of the genus by the natives. The geographical range is nearly the same as that of *P. owariensis*, and it occurs in nearly all the primæval forests in the interior of Angola, where at an elevation from 1500 to 2500 ft. it is often met with; it is a beautiful climber, with its snow-white, jessamine-scented flowers and sweet acidulous fruit.

3. **P. crassifolia.**

Landolphia Petersiana (Kl.), var. *crassifolia* K. Schum., *l.c.*, p. 408, as to Welwitsch's No. cited, t. xii. fig. A.

A robust shrub, widely climbing; branches and peduncles becoming woody when old, very tenacious, dusky, puberulous or glabrescent; leaves dryly coriaceous, hard, rigid, oval or oblong, nearly rounded or obtuse at the base, obtusely cuspidate at the apex, subglabrous except the puberulous midrib beneath, deep green and glossy above, paler and beautifully reticulate beneath, 3 to 4½ in. long by 1¼ to 2⅛ in. broad; lateral nerves patent, numerous, delicate; petiole ⅛ to ⅔ in. long, puberulous; flowers 1½ to 1⅞ in. long just before expansion, whitish, very abundant, salver-shaped, whitish, umbellate-capitate in terminal and axillary retroflected or nodding pedunculate often quasi-cirrhiform panicles; calyx sub-campanulate, tomentellous outside, ⅛ in. long, with a quinquefid limb; the lobes sometimes unequal and distant, in other flowers broader approximated and almost equal; corolla-tube straight or a little incurved, somewhat puberulous outside, about 1 in. long or rather more, yellow at the base where it is covered by the calyx, a little dilated and then narrowed and again dilated about the situation of the anthers, the whole becoming purple, shaggy inside above the stamens; corolla-lobes obovate-oblong, about ½ in. long, on one side bearded with long ciliate hairs, snow-white, dextrorsely contorted in æstivation (as seen from above); stamens placed below the middle of the corolla-tube; style firm, cylindrical, glabrous; stigma capitate-clavate, bilobed at the apex, about on a level with the anthers, the lobes conical; fruit baccate, as large as a good-sized pigeon's egg, perfectly spherical, glaucous-green outside, yellowish inside when ripe, softening, pulpy inside; seeds embedded in the pulp. Native name "Rituti (or Dituti) erá ofele."

Golungo Alto.—In the lower mountain forests of Queta, near Cahunha, and in Sobato de Bumba; fl. and fr. end of Oct. 1855. No. **5927**. Cf. Coll. Carp. 194.

4. **P. parvifolia.**

Landolphia parvifolia K. Schum., *l.c.*, p. 409, t. xii., fig. C.

Huilla.—A much-branched, climbing shrub; flowers white; fruit edible, almost spherical, quite smooth outside (not rough as in the other species), like a small orange in shape, but greenish-purple outside. In the rocky wooded thickets of Morro de Lopollo, at an elevation of 5300 ft.; fl. April 1860; fr. Jan. and Feb. 1860. The negroes of the district call the fruit "Mahungo"; it is also called by the colonists "Maboca pequena." No. **5928**. Shrubby, scandent; flowers pale yellow; fruit spherical, 1 to 2 in. in diameter, pleasantly

acidulous-sweet. Morro de Lopollo, 26 Jan. 1860. "Maboca falso." Coll. Carp. 98.

The name "Maboca pequena" means small Maboca, but it is not the true Maboca, which is the local name of a species of *Strychnos*. The flowers of this species are very like those of *P. owariensis*.

2. **CARANDAS** Adans. Fam. Pl. ii. p. 171 (1763).

Arduina Miller ex L. Mant. Pl. (i.) p. 7 (1767); K. Schum. in Engl. Nat. Pflanzenfam. iv. 2 p. 126 (1895). *Carissa* L., *l.c.*; Benth. & Hook. f. Gen. Pl. ii. p. 695.

1. **C. edulis.**

Carissa edulis Vahl, Symb. Bot. i. p. 22 (1790); Ficalho, Pl. Uteis, p. 221 (1884). *C. dulcis* Schum. & Thonn. in Dansk. Vidensk. Selsk. iii. p. 166 (1828). *Jasminoderium edule* O. Kuntze, Rev. Gen. Pl. ii. p. 415 (1891).

Sierra Leone.—Leaves obtuse; fl. fallen Sept. 1853. Doubtfully placed here; the foliage is like that of *C. Carandas* (L.) which latter is perhaps not specifically distinct. No. **5976**.

Congo.—An evergreen shrub, with edible berries. At Ponta do Padrão at the mouth of the river Zaire, Nov. 1857. No. **5975**.

Ambriz.—At Quizembo, Nov. 1853, after flower. No. **5974**.

Loanda.—A much-branched shrub, as tall as a man, bristling with strong very sharp spines; flowers from whitish to rosy; fruits black, as large as a moderate-sized hazel nut, acidulous-sweet, very pleasant. By thickets towards the west side of the city; fl. Feb. and March. No. **5972**. At Maiango do Povo; fl. Dec. 1857. No. **5973**. A shrub of 6 ft. or more, spiny, the most densely branched of all the shrubs of this region; flowers whitish-rosy, very fragrant; fruit black-purple, edible, pleasantly sweet-acidulous. On the hills of the coast from Loanda to Cacuaco and Morro de Santa Catharina, plentiful: at Maiango del Rei, fl. Dec. 1858. Native name "Jingongôno." No. **5973***b*. A specimen grown in Alves' garden at Lisbon from seeds sent from Loanda; without either fl. or fr. June 1862. No. **5973***c*. A shrub of 5 to 7 ft.; stems cæspitose, very densely branched; flowers whitish, sweet; fruit edible. Loanda; seeds July 1860. "Jingongona." Coll. Carp. 717.

Bumbo.—Flowers whitish-rosy. At Bruco; fl. Oct. 1859. No. **5971**.

Huilla.—A much-branched shrub, with numerous stems, not uncommonly arborescent; flowers white-rosy, very fragrant; fruit edible of the size of a very large cherry. In wooded thickets about Lopollo frequent: fl. Aug., fr. Oct. 1859. No. **5969**. An arborescent shrub, rarely a small tree of 12 ft., much branched, evergreen; fruit red, like a cherry in shape, several-seeded, sweet-acidulous, very pleasant. In rather elevated wooded places near Lopollo; fr. Dec. 1859 and Feb. 1860. Native name "Munhiangolo." Coll. Carp. 53.

Cape of Good Hope.—Leaves thickly coriaceous, rigid, glossy and dusky green above, bright green without gloss beneath; corolla-tube yellowish: the segments of the limb obtuse, obovate-spathulate, obtusely keeled on the back, snow-white. Cultivated in Alves' garden at Lisbon; fl. July and August 1862. This is labelled in the herbarium *Carissa grandiflora*, a species of Alph. DC. from Natal, figured in Wood & Evans, Natal Pl. i. t. 14 (1898), with bifurcate spines and large flowers, perhaps not differing specifically from the above. No. **5970**.

3. **RAUVOLFIA** Plum. Gen. p. 19, t. 40 (1703), L. Sp. Pl., edit. 1 (1753); Benth. & Hook. f. Gen. Pl. ii. p. 697 (*Rauwolfia*).

1. **R. caffra** Sonder in Linnæa xxiii. p. 77 (1850) (*Rauwolfia*).

Var. **natalensis** Stapf ms.

R. inebrians K. Schum. in Eng. Pfl. Ost-Afr., C, p. 318 (1895) (*Rauwolfia*). *R. natalensis* Sonder, *l.c.*, p. 78.

Pungo Andongo.—A notable tree, 25 to 35 ft. high, 12 to 15 in. in diameter of its trunk, with the habit almost of Mango, milky; flowers whitish; fruit obcordate, thick, greenish. By streams in the præsidium, plentiful; fl. and young fr. Jan. and Feb. 1857; fr. Dec. 1856. No. **5951**.

4. **PLEIOCARPA** Benth. in Benth. & Hook. f. Gen. Pl. ii. p. 699.

1. **P. Welwitschii** Stapf ms. in Herb. Kew.

Golungo Alto.—A tree, 10 to 18 ft. high; trunk 6 in. in diameter at the base, erect, as well as the branches exuding a whitish thick resinous milk which quickly coagulates into a kind of elastic gum; branches patent, flexuous, elongated, as well as the branchlets thickened in a nodose manner at the insertion of the leaves; nodes with 3 gibbosities or tubercles. Sometimes there are 4 tubercles in a whorl, each of them bearing a flower-bud; it thus appears that typically there are 4 leaves in the whorl, one of which however is almost always abortive. Leaves $3\frac{1}{4}$ to 7 in. long by $1\frac{1}{4}$ to $2\frac{1}{2}$ in. broad, elliptical, ternately or quaternately verticillate or opposite, rigidly coriaceous, shining; petioles ascending-recurved, thick, semi-cylindrical, transversely rugose or rather sulcate in an annular manner, the furrows rather deep, almost like fissures; flowering branchlets longitudinally furrowed, verrucose; flowers whitish, or white, turning to sulphur-yellow, small, $\frac{3}{8}$ in. long, fasciculate a few together in very abbreviated axillary cymes; calyx small, scariously bracteolate at the base, fleshy, deeply 5-lobed; the lobes imbricate in æstivation, ovate, very obtuse, sub-fimbriate on the membranous-hyaline margin, green; corolla rather fleshy, salver-shaped, inserted about the ovary at the bottom of the calyx; the tube white, slender, but little narrowed at the middle, gradually widened into the 5-cleft deep sulphur-yellow limb; the segments ovate-subrotund, rather concave, sinistrorsely contorted (as seen from above) in æstivation, spreading at the time of full flowering, much shorter than the tube; stamens 5, inserted on the corolla-tube a little below the throat, nearly included, very short; anthers ovate, obtuse, not appendaged, free, not adhering to the stigma, 2-celled, longitudinally dehiscing, yellow, large in proportion to the filaments; disk or hypogynous glands none or obsolete or consisting of a thin viscid-shining cupuliform membrane surrounding the base of the ovary; ovary ovoid, deeply bisulcate, separable into two parts or lobes, the lobes each uniloculate; style elongated, filiform, reaching as high as the stamens, consisting of 2 concrete styles corresponding to the 2 lobes of the ovary, easily parted, somewhat compressed; stigma terminal, narrowly clavate or ovoid-conical, obsoletely bilobed, easily dividing into two with the style; fruit baccate, obovoid-clavate or -pyriform, especially abounding in a resinous milk, fleshy, 2-lobed or 2-celled, one cell abortive, the other 1- or 2-seeded; seeds peltate. In shady woods or at the outskirts of the primitive forest on the left bank of the river Cuango, rather rare; fl. June 1856; young fr. and fl.-bud beginning of Dec. 1855. No. **5981**.

Pungo Andongo.—A small tree of 5 to 8 ft.; branchlets elongated; leaves ternate or opposite or quarternate; juice viscid, at length elastic. By thickets in wooded places along the stream Luxillo, sporadic; young fr. Feb. 1857. Probably the same species, but the leaves rather narrower. No. **4551**.

The dicarpellary ovary presents some difficulty as to placing this tree in the above genus, but the inclusion in the genus of *P. bicarpellata* Stapf in Kew Bull. 1894, p. 21, helps to overcome it; moreover, the fact that the ovary is unlobed for a considerable time and apparently in some cases entire even in fruit suggests for it the genus *Acokanthera* G. Don; its axillary inflorescence precludes its reference to *Rauvolfia*, to which in many respects it approaches.

5. **DIPLORHYNCHUS** Welw. ex Ficalho & Hiern. in Trans. Linn. Soc., ser. 2, ii. p. 22 (Dec. 1881); K. Schum. in Engl. Nat. Pflanzenfam. iv. 2, p. 142 (*Diplorrhynchus*) (1895).

Follicles 2 together; each obovate, sickle-shaped, falcately diverging, beset on all sides with distant warts, rather broad at the sessile base, shortly firmly and thickly beaked at the apex, somewhat compressed, woody, very tenacious, bivalved in an elastic manner, longitudinally dehiscing along the inner convex ventricose edge, 3- or perhaps sometimes 4-seeded; the valves quite smooth inside; seeds according in shape to the follicles and parallel to its sides, compressed, extended downwards into a broad membranous ovate-oblong obtuse wing; raphe dorsal, prolonging the free funicle to the centre of one side between the seeds; endopleura thin, membranous, whitish, albumen sparse, fleshy, white; embryo obliquely reniform in the middle of the seed, small, those of the two lateral (outer and inner) seeds being three or four times larger; cotyledons deeply cordate, unequal, flat, rarely with one or two inflected lobes; radicle acutely conical, oblique, directed towards the hile, small.

1. **D. psilopus** Welw., *l.c.*, p. 23, t. 5; Ficalho, Pl. Uteis, p. 221 (1884); K. Schum, *l.c.*, and p. 140, fig. 54. M, N.

Huilla.—A small, lactescent tree, sometimes a climbing shrub or in other cases a bush standing erect with one or two scandent branches: leaves evergreen, coriaceous, glossy; flowers white, very fragrant. In the more elevated, hilly places near Nene, in company with Combretaceæ; fl. and fr. Oct. 1859. No. **5982**. A much-branched bush, 6 to 10 ft. high; branches sarmentose; leaves evergreen, glossy, broadly ovate; flowers white, like those of a jessamine in shape and very sweet fragrance, corymbose at the ends of the branchlets; follicles short, almost half-ovate, scarcely an inch long, woody, spread out when quite ripe into a nearly flat disk; seeds broadly winged, not comose. In the small forests of Humpata; fl. and fr. Oct. 1859 and June 1860. Coll. Carp. 64.

According to a note of Welwitsch, this plant occurs also in the districts of Cazengo and Pungo Andongo, and is known by the name of "Jasmin do Pereira de Cazengo." The following, represented by only one specimen and consisting of a broadly obversely deltoid rugose glabrous fruit, $1\frac{1}{5}$ in. long, $1\frac{3}{4}$ in. broad and $\frac{4}{5}$ in. thick, perhaps belongs here:—

Pungo Andongo.—A tree in leaf. At Tunda Quilombo in the præsidium; fr. Feb. 1857. Coll. Carp. 729.

2. **D. angolensis** Büttner in Verh. Bot. Brandenb. xxxi. p. 85 (17 Sept. 1889) (*Diplorrhynchus*).

Diplorhynchus, sp. nov., Ficalho, *l.c.* *Diplorhinchus Welwitschii* Rolfe in Bol. Soc. Brot. xi. p. 85 (1893). *D. Poggei* K. Schum., *l.c.*, p. 142 and p. 140, fig. 40, O.

Cazengo.—A shrub, 8 to 15 ft. high, shaped like a tree and then widely scandent with long sarmentose whiplike branches, apparently not lactescent; flowers whitish. In dense thickets and at the outskirts of forests on both banks of the river Luinha, not uncommon; fl. and remains of fr. 26 Dec. 1854. No. **5968**.

Golungo Alto.—Usually a much-branched, many-stemmed, widely climbing, robust, long-sarmentose, arborescent shrub, or when fully developed a small tree with a trunk 4 to 6 in. in diameter; flowers white, fragrant; stamens inserted on the middle of the dilated corolla-tube a little below the throat; filaments very short; anthers triangular-pyramidal, connivent at the apex, yellow; ovary depressed-globose, obtusely pentagonal; style whitish; stigma green, much broader than the style, cupuliform, obscurely pentagonal, bearing in the middle within the cup a red ovoid-conical stigmatoid mass. In the Queta forests, fl. Oct. 1855; also at the outskirts of the dense forests among the elevated Capopa mountains, fl. Dec. 1855. No. **5984**.

Ambaca.—An arborescent shrub; trunk short, 4 in. in diameter, soon divided into innumerable very densely ramulose branches; flowers white, very fragrant, jessamine-scented; follicles geminate, distinct from the base, diverging, woody; seeds broadly winged. In rather elevated bushy places near Puri-Cacarambola, in company with *Nathusia trichoclada* O. Kuntze; fl. and fr. Oct. 1856. No. **5983**. A small tree, scarcely 10 ft. high, usually lower; one or two branches scandent; seeds broadly winged at the apex. In wooded mountainous parts of Puri-Cacarambola; fr. Oct. 1856. Coll. Carp. 727.

This shrub is called by the Portuguese colonists "Jasmineira" or "Jasmin de Cazengo" or "Jasmineiro d'Africa."

6. **VINCA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 703.

1. **V. rosea** L. Syst. Nat., edit. 10, ii. p. 944 (1759).

Lochnera rosea Reichenb. Conspect. p. 134 (1828); Durand & Schinz, Congo, i. p. 190 (1896).

Island of St. Thomas.—Plentiful and almost wild about dwellings, but probably introduced in former times; fl. and fr. Dec. 1860. No. **5986**.

7. **PLUMERIA** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. p. 704.

1. **P. rubra** L. Sp. Pl., edit. 1, p. 209 (1753).

Loanda.—A shrub with a thick fleshy patently and articulately branched stem and very agreeably fragrant rose-purple flowers centrally placed in the terminal fascicle of the leaves. Cultivated in the Museque Lopes on the island of Loanda; fl. May 1854. Called by the Portuguese colonists "Jasmin mangueira." Apparently this species. No. **5985**.

8. **TABERNANTHE** Baill. in Bull. Soc. Linn. Paris i. p. 783 (1889); K. Schum. in Engl. Nat. Pflanzenfam. iv. 2, p. 146 (1895).

Iboga K. Schum., *l.c.*

1. **T. Iboga** Baill., *l.c.*; Oliv. in Hook. Ic. Pl. xxiv. t. 2337 (1894).

Pungo Andongo.—An arborescent shrub 5 to 6 ft. high; sometimes

a small tree 8 to 12 ft. high, rarely 15 ft., bare to the top of the slender trunk of 5 to 6 ft., then patently branched ; branches and branchlets dichotomous, compressed at the nodes ; leaves thinly coriaceous or membranous, a little fleshy, dark green, soft and rather glossy above, pale yellowish-green and rather shining beneath ; stipules interpetiolar, inside with dense rows of whitish cilia ; flowers yellow ; calyx 5-cleft, the lobes keeled, imbricate, corolline-yellowish, closely investing the base of the corolla ; corolla somewhat salver-shaped, sulphur-coloured ; the tube dilated below, fleshy, gradually constricted towards the throat ; the limb 5-cleft ; the segments patent during the flowering, soon revolute, contorted dextrorsely (as seen from above) in æstivation, unequal-sided, the outer side undulate ; stamens inserted below the middle of the corolla-tube (where it is dilated) ; filaments scarcely any ; anthers subsessile, sagittate, shortly aristate at the apex, surrounding the stigma in a pyramidal manner ; ovary ovoid, entire, obsoletely bisulcate, unilocular ; placenta central, multi-ovulate ; style firm, cylindrical, bearing at the apex the ovoid-acuminate stigma which is situate upon a very broad membranous disk ; ripe fruit as large as a pigeon's egg, like a lemon in its shape and golden colour. In small woods, occupying the deepest cracks of the rocks of the præsidium ; fl. Nov. 1856 ; also in the primitive thickets of Barrancos da Pedra Songue in the præsidium, at the Cazalalé, rather rare, fl. and fr. Dec. 1856, Feb. and April 1857. No. **5950**. An evergreen little tree ; flowers yellow ; fruit consisting always of only one follicle, straight on the peduncle, in form and colour like a small lemon. In damp forests in the præsidium ; fl. Dec. 1856, fr. Feb. 1857. COLL. CARP. 728.

9. **VOACANGA** P. Thouars in Roem. Coll. Bot. p. 203, n. 32 (1809).

1. **V. angolensis** Stapf ms. in Herb. Kew.

V. africana Stapf in Journ. Linn. Soc. xxx. p. 87 (partly) (1894).

AMBACA.—A milky shrub of 5 to 7 ft. ; stems erect, rather much-branched ; branches spreading, almost uniformly dichotomous, marked with the scars of fallen leaves, copiously flowering ; leaves thinly coriaceous, rather fleshy, shining, deep green ; flowers deep sulphur-yellow, attractive. In bushy hilly places between N-gombe and Puri-Cacarambola ; fl. middle of Oct. 1856. No. **5978**.

GOLUNGO ALTO.—A small tree abounding in a milky viscid juice ; leaves sub-coriaceous, glossy above ; flowers sulphur-yellow ; follicles (by abortion usually solitary on each peduncle, which becomes woody compressed and two-edged as the fruit ripens), of the size of a small apple, pale yellow, subglobose, somewhat striate, obliquely umbonate, filled with a yellow pulp and embedded seeds, dehiscing on one side from the base to the umbilicus. In wooded rather elevated places near Canguerasange and Quilombo ; fl. Nov. 1854. No. **5979**. An arborescent shrub, evergreen ; flowers sulphur-yellow ; follicles as large as a hen's egg, ovoid-claviform, many-seeded. Queta ; seeds, May 1856. COLL. CARP. 720. A small tree of 6 to 9 ft., patently branched, in secondary thickets usually a shrub ; stems and all parts, even the fruit, abounding in a thick milk ; flowers sulphur-yellow ; fruit drupaceous, as large as a walnut, usually two together on the peduncle, unilocular ; seeds very numerous, embedded in pulp. In shady forests among the mountains of Quibixe, etc., plentiful ; fl. and young fr. Nov. and Dec. 1855. No. **5980**. A broadly frondose tree of 15 to 20 or rarely of 25 ft., in secondary woods about 20 ft. high, or an arborescent shrub ; flowers flaxen yellow. Queta, fr. May 1856 ; Mussengue, fr. July 1857. COLL. CARP. 721. No notes. COLL. CARP. 956. A small tree or

tree-shaped shrub, 6 to 9 ft. high, lactescent ; branches dichotomous, the older ones cylindrical, the younger obscurely quadrangular, the youngest ones compressed, two-edged ; calyx campanulate, herbaceous-green, 5-cleft, loosely embracing the corolla, the tube multiglandular at the base inside, the lobes oblong-elliptical and spreading or reflected ; corolla hypogynous, salver-shaped, sulphur-coloured throughout, the tube inflated, spirally twisted dextrorsely, constricted at the throat, the lobes oblong, sinistrorsely contorted in æstivation, afterwards spread out, oblique ; stamens 5, inserted on the upper part of the corolla-tube, the tips only exserted ; anthers sagittate, hard, almost cartilaginous, connivent into a pyramid by their very subulate tips, the divisions at their base diverging ; pistil surrounded by a thick hypogynous ring, consisting of 2 mammiform ovaries which laterally coalesce and from the centre of coalescence of which the style arises ; style simple, rather thick, gradually thickened upwards, bearing at the top in a patelliform dilation the capituliform shortly stalked stigma ; ovules very numerous in each ovary, attached to the suture. In the more elevated forests of the Alto Queta mountains ; fl. May, beginning of Oct., and Nov. 1855. No. **5931**.

Cf. Baillon in Bull. Mens. Soc. Linn. Paris, i. p. 778 (1889).

2. **V. Thouarsii** Roem. & Schultes, Syst. iv. p. 439 (1819).

V. obtusa K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. iv. 2. p. 149 (1895), and in Engl. Bot. Jahrb. xxiii. p. 226 (1896).

Ambaca.—A small tree, 12 to 18 ft. high ; trunk 4 in. in diameter ; branches patent ; branchlets dichotomous ; leaves opposite, fasciculate towards the ends of the branchlets, lactescent as well as the branches ; flowers large, whitish, very pleasantly fragrant ; corolla fleshy. In moist deep valleys and along streams from N-gombe in the direction of Puri-Cacarambola, here and there ; fl. middle of Oct. 1856. No. **5977**.

10. **TABERNÆMONTANA** Plumier, L. ; Benth. & Hook, f. Gen. Pl. ii. p. 706.

1. **T. longiflora** Benth. in Hook. Niger Fl. p. 447 (1849).

Tabernæmontana sp., Welw. in Bol. Conselho Ultramar. Lisb., No. 7, p. 82 (Aug. 1854).

Sierra Leone.—A robust, lactescent, much-branched, very elegant shrub ; leaves coriaceous, evergreen, glossy, pallid beneath ; flowers whitish, very pleasantly fragrant ; fruit as large as an orange, geminate-didymous, furrowed in the middle ; seeds numerous. In elevated thickets near Freetown ; fl. and fr. Sept. 1853. No. **5987**. A small tree ; seeds, Sept. 1853. Coll. Carp. 718.

2. **T. angolensis** Stapf in Kew Bull. 1894, p. 23.

Apocynacea, Welw. Apontam. p. 588, n. 55 (1859).

Pungo Andongo.—A moderate-sized tree, up to 26 ft. high, spiny ; head lax ; leaves thickly coriaceous, glossy ; flowers large, white, salver-shaped, very agreeably fragrant ; mericarps 2 together, as large as an orange, spherical. On the shady sides of rocks throughout the præsidium, plentiful ; fl. and ripe as well as young fr. usually occurring at the same time ; fl. Dec. 1856. No. **5989**. A small tree, 12 to 15 ft. high, evergreen, with the habit of the genus ; leaves coriaceous ; flowers large, white, fragrant ; mericarps orange-shaped, geminate. In the forests of the præsidium ; seeds May 1857. Coll. Carp. 731. Fruit geminate, like an orange ; May 1857. Coll. Carp. 722. A small,

sightly tree, with white very fragrant flowers and orange-shaped fruits. In forests ; seeds March 1857. Coll. Carp. 730.

Island of St. Thomas.—Inflorescence terminal or sub-terminal, in opposite drooping or nodding cymes ; unexpanded flowers 1½ in. long. Local name "Cata grande." Fl. Dec. 1860. Apparently this species. No. **5988**.

According to Welwitsch, *l.c.*, the seeds are wrapped in corky membranes. The plant in St. Thomas, mentioned by Henriques, Bol. Soc. Brot. x. p. 140, as having the native name of "Catta grande," and described by him under the name of "*Orchipeda*, n. sp. ?", is quite different from this.

The following No. is apparently an undescribed species of *Tabernæmontana* :—

Pungo Andongo.—A lactescent tree with obpyramidal subcordate fruit. In forests at the river Tangue ; fr. May 1857. No. **5952**.

11. **STROPHANTHUS** DC.; Benth. & Hook. f. Gen. Pl. ii. p. 714. *Zygonerion* Baill. in Bull. Mens. Soc. Linn. Par. i. p. 758 (1888).

1. **S. Preussii** Engl. & Pax in Engl. Bot. Jahrb. xv. p. 369 (1892) ; Franchet in Nouv. Archiv. Mus. Hist. Nat., sér. 3, v. p. 279 (Nov. 1893).

Golungo Alto.—A shrub, climbing far and widely, not lactescent ; branches dusky-purple, scattered with small white warts ; leaves herbaceous, membranous, soft, opaquely green and marked with black spots above, pallid and without spots beneath ; calyx 5-partite, the segments unequal, the 2 outer ones broadly cordate, the 3 inner ones lanceolate ; corolla orange-red, marked inside with 15 purple vertical lines, one-third larger than in *S. ecaudatus* Rolfe, funnel-shaped ; the limb 5-cleft ; the lobes with very long tails, 5 in. long ; throat-appendages 10, not arched, semicircular ; throat and tube pilose-tomentose ; stamens 5, connivent in a pyramid around the stigmatose part of the style ; anthers sagittate, densely pilose as are also the upper parts of the filaments ; ovary bilobed, densely and shortly pilose ; hypogynous scales 10, approximated in pairs, pale yellowish. In secondary woods between the river Delamboa and the Capopa spring ; fl. end of Dec. 1855. No. **5996**.

Pungo Andongo.—An evergreen shrub, subscandent or scarcely decumbent upon other shrubs ; corolla from deep sulphur to orange colour ; the tails or appendages of the lobes of the limb green-yellowish ; scales of the throat sulphur-coloured. In elevated wooded bushy places, in the shade of the gigantic rocks of the præsidium at Santo Antonio ; fl. middle of Oct. 1856 and Feb. 1857. No. **5995**.

The following No. is doubtfully referred to *S. Preussii* :—

Pungo Andongo.—A robust, bushy shrub ; follicles nearly a foot long. In Mata de Quilanga ; scarcely ripe fr. Dec. 1856. The seeds are ¾ to 1 in. long by ⅛ to $\frac{3}{16}$ in. broad, glabrous, rugose and minutely pitted, comose at the apex with spreading silky slightly coloured hairs of about 2 in. in length ; cotyledons plicate. No. **5998**.

2. **S. parviflorus** Franchet in Journ. de Bot. vii. p. 303 (16 Aug. 1893), & *l.c.*, p. 281, t. 11 B.

Golungo Alto.—A slender, widely climbing shrub ; juice rather viscid, watery, not milky ; branches sarmentose, very slender, long ; branchlets opposite ; leaves membranous, opaquely green and scarcely

shining above, paler beneath, slightly wavy on the margin ; flowers very elegant, not clustered ; calyx 5-partite, green, spreading at the time of the open flower ; corolla funnel-shaped ; the tube and quinquefid limb whitish, quickly turning to a sulphur colour, with purple streaks inside ; the segments of the limb from a broad base caudate : the tails very long, yellowish green ; scales of the corolla-throat 10, scarlet, erect, obtuse, approximated in pairs, with 10 purple lines proceeding from their base towards the bottom of the internally naked corolla-tube ; stamens 5, inserted at the middle of the corolla-tube, exserted, not reaching the level of the top of the corolla-limb ; anthers sagittate, mucronate (the mucro and basal appendages empty), closely connivent around the stigma and thus forming a pyramid completely covering the apex of the style ; carpels 2, coalescent on the sides, smooth ; style 1, cylindrical, thick, soft, white ; stigma sub-cylindrical, pressed by the anthers ; hypogynous scales 0. At the outskirts of primitive forests on the northern side of the Queta mountains, rare : fl. 25 Dec. 1855. No. **5994**.

3. **S. Schuchardtii** Pax in Engl. Bot. Jahrb. xv. p. 371 (1892) : Franchet, *l.c.*, v. p. 276.

Huilla.—A shrub, 4 to 5 ft. high ; head hemispherical ; branchlets crowded, verrucose with the scars of fallen leaves ; leaves velvety-pubescent, lepidote between the nerves ; calyx greenish purple ; corolla-tube sanguineous-purple. In elevated rocky places near Lopollo, not plentiful, fl. 1 and 2 Dec. 1859 ; in rocky places between Ferrão da Sola and Nene ; fl. April 1860. "Gazellenjugi." No. **5992**.

4. **S. intermedius** Pax, *l.c.*, p. 375 ; Franchet, *l.c.*, p. 287.

Golungo Alto.—A subscandent lactescent shrub, with the habit of *Cryptolepis triangularis* N.E. Br. ; corolla-lobes purple beneath, whitish towards the base, inside as well as the corolla-tube deep yellow, almost orange-coloured ; follicles obtusely conical, hard-woody ; at the outskirts of the forest near the Capopa spring, sporadic, fl. and fr. Oct. 1854. A tree-shaped shrub, in old age scandent, called by the negroes "Môsŭă" ; seeds with very elegant coma ; among the Alto Queta mountains ; fr. Nov. 1854. No. **5999**. A climbing shrub, called "Bella" in Quilombo, "Môsŭă" in Bumba and Mussengue, and "Fuco-hamoxi" in Alto Queta ; at Sange, without either fl. or fr. May 1855. No. **5999***b*. A shrub, standing erect, 6 to 8 ft. high, with a trunk tree-like at the base, and then divided into branched or, if the plant grows solitary, with numerous lax branches from the base, climbing to a great height ; flowers campanulate, handsome, from orange to purplish in colour ; corolla-lobes with very long tails. Among the mountains of Alto Queta ; fl. and fr. Nov. 1854 Coll. Carp. 719. Capopa ; fr. Coll. Carp. 725.

The negroes cut tubes for their tobacco-pipes from this shrub. In Pungo Andongo the name *Môsua* is applied to the long cylindrical legumes of *Cassia Sieberiana* DC. (Welw. herb. n. 1740).

5. **S. ecaudatus** Rolfe in Bol. Soc. Brot. xi. p. 85 (1893) (*ecaudatus*).

Zygonerion Welwitschii Baill. in Bull. Mens. Soc. Linn. Par. i. p. 758 (1888).

Pungo Andongo.—A slender twining shrub, climbing to a great height, copiously lactescent with a yellowish resinous milk ; flowers handsome, whitish-purplish ; follicles about a foot long, green-purplish,

at the base as thick as the middle finger, cylindrical-subulate, unisulcate beneath, geminate at a very wide angle when not quite ripe. In low forests between Cazella and Luxillo, sparingly; fl. Oct. 1856. No. **5926**. An evergreen, twining, resinous-milky shrub; bark verrucose; leaves coriaceous, deep green and rather shining above, whitish beneath; corolla handsome, dilated-campanulate, white; segments of the limb rosy, without tails at the apex, reflected at the time of the open flower; ligules of the throat 10, linear-lanceolate, deep purple: stamens inserted on the corolla-tube, included; anthers sagittate, aristate at the apex, pyramidately surrounding the *Phallus*-shaped stigma in the excavation at its insertion on the style, follicles divaricate, 3 to 4½ in. long, rather obtusely subulate, obtusely angular at the base, subcompressed-bisulcate at the apex. In wooded thickets between the præsidium and the river Cuanza, rather rare; fl. and young fr. 16 Nov. 1856. No. **5991**.

Huilla.—A shrub, as tall as a man; branches at length elongated, climbing; bark minutely white-tuberculate; flowers campanulate, whitish, rosy inside on corolla-tube and ligules; corolla-lobes not appendaged at the apex, but bi-ligulate about the throat inside; follicles elongate-conical, tuberculate. In Morro de Lopollo fl. Dec. 1859. No. **5990**. An evergreen, very beautiful, arborescent shrub or small tree of 5 to 7 ft.; branches sarmentose; corolla whitish-rosy, variegated with purple on the throat and ligules, the segments of the limb scarcely caudate. In the forests of Cordicheira, Lopollo; fr. Jan. and May 1860. Coll. Carp. 22. Without locality or notes. Coll. Carp. 1117.

12. **MOTANDRA** Alph. DC.; Benth. & Hook. f. Gen. Pl. ii. p. 715.

1. **M. guineensis** Alph. DC. in DC. Prodr. viii. p. 423 (1844).

Echites guineensis Thonn. ex Schum. in Dansk. Vidensk. Selsk. iii. p. 169 (1828). *E. paniculata* Thonn. ex Alph. DC., *l.c.*, non Poir. nec Roxb.

Golungo Alto.—A robust shrub, climbing far and high, more or less lactescent; branchlets rufous-tomentose; leaves closely resembling those of a beech, deep green, chartaceous-herbaceous, glossy, almost glabrous, somewhat pilose along the midrib and at the axils of the lateral nerves; flowers moderately abundant; corolla whitish, quickly withering, salver-shaped; the lobes of the limb spreading at the time of the open flower, linear-lanceolate, rather obtuse; corolla-tube naked within, inflated at the base; stamens 5, inserted at the base of the tube; filaments rather thick, curved inwards; anthers sagittate, closely adpressed to the stigma, comose at the apex; hypogynous glands 5, sordid-yellow, erect, flattened, truncate at the apex, lamelliform; style seated on the hollowed apex of the ovary ovoid-fusiform bifid at the apex and stigmatose nearly throughout (or the style short, with a fusiform stigma bifid at the apex); ovary 2-celled, the cells with many ovules. In thickets by the Ambaca road near Ponte de Luiz Simões (a very milky state of the plant); fl. end of Oct. 1855. Ponte de Felix Simões; fl. and fr. 22 Oct. 1854; on the highest ridges of the forests of Alto Queta (a sparing milky state); fl. beginning of Nov. 1855. No. **5964**. A very lactescent and extensively scandent shrub; leaves opposite, smooth; flowers paniculate, white; near Ponte de Felix Simões; fl. and fallen fr. Oct. 1854. Seeds only, perhaps belonging to this species. Coll. Carp. 723.

Coll. Carp. 1118, consisting of follicles about 6 in. long shortly

hooked at the tip, and comose seeds, should be compared with this species ; there are not accompanying notes.

13. **ZYGODIA** Benth. in Benth. & Hook. f. Gen. Pl. ii. p. 716.

1. **Z. axillaris** Benth. in Hook. Ic. Pl. xii. p. 73, t. 1184 (1876).

Golungo Alto.—A high-climbing shrub, with nodding branches and branchlets and deep yellow flowers. In Mata de Trombeta, fl. Jan. 1855 ; also among the Queta mountains, young fr. May 1856. No. **5960**. In fr. No. **5963**. Quibólo, without either fl. or fr. July 1856. Apparently this or an allied species ; leaves more oblong on very short petioles. No. **5962**.

2. **Z. urceolata** Stapf in Kew Bull. 1894, p. 122.

Golungo Alto.—In fl. No. **5961**.

14. **ALAFIA** P. Thouars ; Benth. & Hook. f. Gen. Pl. ii. p. 717.

1. **A. cuneata** Stapf in Kew Bull. 1894, p. 122.

Loanda.—No notes. In fl. No. **5954**.

Golungo Alto.—A sightly evergreen, robust, lactescent shrub, widely climbing or, when young, usually standing erect and in that condition flowering ; leaves thickly and dryly coriaceous, glossy, but little paler beneath ; flowers innumerable, agreeably aromatic ; corolla deep yellow, towards the throat as well as the velvety throat pleasantly peach-red ; the lobes of the limb truncate in a rectangular manner, of a whitish sulphur colour. In the dense forests of Alto Queta, rather rare ; fl. June 1855. On the left-hand side of the Ambaca road ; fl.-bud Dec. 1855. Also in the shady forests and in the secondary thickets of Alto Queta and near Camilungo : fl. and fr. end of Dec. 1855. No. **5953**.

2. **A. caudata** Stapf, *l.c.*, p. 123.

Golungo Alto.—An evergreen, sparingly lactescent shrub, climbing far and high, very multifarious in habit, resembling a jessamine ; leaves thinly coriaceous, glossy, paler beneath ; flowers milk-white, but little fragrant. In the dense mangue forests among the mountains of Alto Queta : fl.-bud middle of Nov. 1855 ; fl. beginning of Dec. 1856. No. **5938**. A lactescent shrub, climbing to a height of 15 to 25 ft. ; leaves glossy, evergreen ; flowers fragrant or but slightly so, quickly turning brown ; calyx campanulate-quinquefid, green, the lobes membranous on the margin ; corolla salver-shaped, milk-white (or yellow ?) ; the limb 5-cleft, the segments ovate-lanceolate, obtuse, sinistrorsely contorted (as seen from above) ; the tube but little inflated at the base, abruptly cylindrical, ventricose in the middle, and thence up to the limb obtusely pentagonal, rather pilose at the throat ; stamens 5, inserted at the ventricose part of the corolla-tube, included ; filaments very short or almost obsolete ; anthers lanceolate- (sagittate-) subulate, pilose at the base inside, connivent in a pyramidal manner at their empty tips, very closely adhering to the stigma, whitish ; ovary ovoid, sessile, reaching the level of the calyx-lobes, green, obsoletely pentagonal, apparently bilocular and many-seeded ; styles 2, closely coalescing into one central one ; stigma fusiform ; disk 0. In the more elevated dense Paco (mangue) forests (composed of *Corynanthe paniculata* Welw. herb. n. 1508, *ante* p. 437), and on their outskirts, among the mountains of the eastern Queta ; fl. middle of Dec. 1855 and Feb. 1856. No. **5955**. Queta mountains, in primitive forests. Without either fl. or fr. Sept. 1855. No. **6692**.

3. **A. sarmentosa** Stapf, *l.c.*, p. 123.

Golungo Alto.—An evergreen, lactescent shrub, with the habit of a jessamine, climbing widely, pendulous ; branches long, sarmentose, encumbering bushes and the lower trees ; flowers whitish-rosy, very agreeably vanilla-scented ; corolla salver-shaped, white ; the throat somewhat bearded, blood-red ; the lobes of the limb ovate-lanceolate, rather obtuse. In the less dense thickets among the Queta mountains, above N-dele, rather rare ; fl. end of March 1856. No. **5965**.

15. **ONCINOTIS** Benth. in Benth. & Hook. f. Gen. Pl. ii. p. 718.

1. **O. hirta** Oliv. in Hook. Ic. Pl. xiii. p, 25. t, 1232 (1878).

Motandra Welwitschiana Baill. in Bull. Soc. Linn. Paris, i. p. 760 (1888).

Golungo Alto.—A robust arborescent shrub, climbing far and high, copiously lactescent, distinguished by the yellowish colour of all its parts and covered with a felt composed of branched hairs ; the milky juice very sour ; leaves pleasantly green in the living state, at length in the dry state turning yellow ; flowers from whitish to yellowish, almost greenish ; corolla salver-shaped, spreading in a star at the time of the open flower, of a pale sulphur colour ; the tube pentagonal at the base where it is inserted outside a cyathiform disk 5-lobed at the mouth ; lobes of the corolla-limb 5, lanceolate, rather fleshy ; the throat closed with 5 corniculate appendages alternating with the lobes ; the tube pilose within ; stamens 5, inserted a little above the base of the tube ; filaments broad, very short ; anthers white, lanceolate, acuminate at the apex, produced at the base into hyaline glands, adhering to the style (or rather to the stigma), and so connivent ; ovary sessile at the bottom of the disk, reaching higher than the cup of the disk, ovoid-cylindrical, 2- (or perhaps 3- or 4-) lobed at the apex, pilose ; style central, 1, as high as the stamens, fusiform-thickened upwards, inflated and stigmatose above, terminating at the apex in a subulate not stigmatose appendage ; young follicles geminate, shaggy-tomentose with a dusky felt. Along streams from Quilombo-Quiacatubia towards the river Zenza, young fr. Feb. 1855 ; by the dense thickets along the base of the mountains of Quilombo-Quiacatubia, also in Queta, Ponte de Felix Simões, fl. Dec. 1855 ; also by the tall secondary thickets between Ponte de Luiz Simões and Camilungo ; fl. April and May 1855. No. **5956**.

2. **O. glabrata** Stapf. ms. in Herb.

Motandra glabrata Baill. in Bull. Soc. Linn. Paris, i. p. 760 (1888).

Golungo Alto.—A robust, lactescent shrub, climbing rather high and widely ; flowering branchlets nodding ; leaves coriaceous, shining ; flowers from green to yellow ; follicles conical, terminating at the apex in a curved acumen. At the outskirts of the forest by the Ambaca road ; fl. Feb., fr. June 1856. No. **5957**.

The follicles are fusiform, spreading, $3\frac{3}{4}$ to 4 in. long. The following Nos. should be compared with this species, which appears to differ but little from the original species of the genus, *O. nitida* Benth., though the foliage is scarcely so thin and the inflorescence rather denser.

Golungo Alto.—A high-climbing lactescent shrub, with cylindrical-conical follicles 3 to 4 in. long ; in the forests of the Queta mountains, rather rare ; fr. 8 Oct. 1855. No. **5958**. By the Capopa road ; without either fl. or fr. May 1856. No. **5959***b*. A robust, climbing shrub ; flowers yellow ; follicles large, conical-cylindrical, opposite, spreading

at a very wide angle, terminating at the apex in an incurved acumen. In secondary woods at the banks of the river Coango ; fr. June 1856. No. **6014**. A sarmentose, apparently climbing shrub ; leaves ovate-oblong or elliptical ; flowers yellow ; corolla-throat corniculate with erect connivent scales. Behind Rodrigo's house ; seeds Oct. 1855. Coll. Carp. 724.

Ambaca.—An arborescent, scandent, lactescent shrub ; adult stems blackish purple ; branches virgate ; fibre very slender ; leaves thinly coriaceous, yellow-greenish beneath ; flowers yellow. In thickets near Izanga and Cabinda ; without either fl. or fr. Oct. 1856. No. **5959**.

16. **BAISSEA** Alph. DC. ; Benth. & Hook. f. Gen. Pl. ii. p. 719. *Perinerion* Baill. in Bull. Soc. Linn. Paris, i. p. 758 (1888).

1. **B. angolensis** Stapf in Kew Bull. 1894, p. 126, excl. var. ; Hua in Bull. Soc. Linn. Paris, n.s., p. 10 (1898).

Golungo Alto.—A very elegant, weak, widely climbing shrub ; branchlets usually 4 to 7 ft. long, pendulous ; flowers very crowded, sweetly aromatic, purplish or whitish-rosy, resembling those of a jessamine, ornamental. By thickets on slopes along the river Cuango, rather rare, fl. March 1856 ; also in dense thickets on the right bank of the same river near the residence of Senhor Rodrigo ; fl. beginning of May 1855. No. **5967**.

2. **B. major**.

B. angolensis var. *major* Stapf in Kew Bull. 1894, p. 126.

Pungo Andongo.—A robust, lactescent shrub, occasionally arborescent ; branches virgate, sarmentose, scandent, the younger ones rufous-tomentose, leaves evergreen, coriaceous, rather shining, yellowish green beneath, with arching veins ; flowers white, fragrant, jessamine-like ; young follicles linear, acuminate, geminate. In moist thickets at the sides of the rocks of the præsidium ; fl. Feb. 1857. No. **5966**.

3. **B. Welwitschii** Stapf ms. in Herb. Kew.

Perinerion Welwitschii Baill. in Bull. Soc. Linn. Paris, i. p. 758 (1888) ; K. Schum. in Engl. Nat. Pflanzenfam. iv. 2, p. 174 (1895).

Golungo Alto.—A copiously lactescent shrub, climbing high and widely ; milk somewhat blue ; branches green, tortuous, cylindrical, very tenacious ; branches sub-opposite, slender ; calyx 5-partite ; the segments imbricate, obtuse ; corolla salver-shaped, sordid-white ; the tube turbinate, shorter than the lobes of the limb, slightly inflated at the base, beset inside with an obsolete ring and 5 fascicles of hairs directed downwards, outside shining, glabrous ; the limb 5-cleft ; the lobes lanceolate, obtuse, whitish, rather concave, sinistrorsely a little contorted in æstivation (as seen from above), spreading in full flower ; throat wide, purple-striate from the mouth to the middle of the tube ; stamens 5, inserted a little above the base of the corolla-tube, included ; filaments short, a little bearded ; anthers sagittate, bilocular, dehiscing longitudinally, connivent in a pyramidal manner around the stigma and closely adhering to it ; ovary sessile, sub-bilobed, bilocular, the cells with many ovules ; style central, turbinate ; stigma ovoid-conical, rather obtuse ; hypogynous disk or glands 0. At the outskirts of primitive forests among the mountains of Alto Queta, rather rare ; fl. Jan. 1856. No. **5932**.

17. **PACHYPODIUM** Lindl. ; Benth. & Hook. f. Gen. Pl. ii. p. 722.

1. **P. Lealii** Welw. in Trans. Linn. Soc. xxvii. p. 43, t. 16 (1869).

Bumbo.—A small tree, 10 to 18 ft. high, with a curious cactus-like habit, 8 to 16 in. in diameter at the base of its trunk, bristling on all sides with tripartite purple spines ; trunk conical, tapering, simple below, sparingly and patently branched towards the apex ; juice scarcely milky, watery-resinous ; leaves none seen at the time of the inflorescence except the bracts ; flowers large, handsome, bicolorous, fragrant, corymbose, fasciculate, occurring during nearly the whole year, but only in summer bearing fruit ; calyx 5-cleft, the lobes ovate, imbricate ; corolla-tube bearded inside below the insertion of the stamens, naked above, inflated in the middle ; the limb 5-cleft ; the segments rosy purple outside, white inside, unequal-sided, one side entire, the other larger and undulate-crisp ; stamens 5, included ; filaments short or nearly obsolete ; anthers bilocular, sagittate : the cells opposite, shorter than the produced connective, confluent at the base, converging towards the apex and there surmounted by the apiculate tip of the nearly flat scarcely subulate connective ; style straight, filiform ; stigma thick, mitriform, perforated with 1 or 2 apertures at the truncate top ; follicles compressed-cylindrical, geminate, about 7 in. long or less, purple ; seeds divaricately comose at the apex. In very dry rocky thickets between Quitibe de Baixo and Quitibe de Cima, common ; fl. and fr. Oct. 1859 and fl. 14 June 1860. No. **1510**.

LXXXIII. ASCLEPIADEÆ.

1. **CRYPTOLEPIS** R. Br. ; Benth. & Hook. f. Gen. Pl. ii. p. 740. *Ectadiopsis* Benth. in Benth. & Hook. f., *l.c.*, p. 741.

1. **C. microphylla** Baill. in Bull. Soc. Linn. Paris, No. 101, p. 84 (804) (1890).

Golungo Alto.—A slender, widely climbing, lactescent shrub ; branches and branchlets reflected patent ; epidermis thinly verrucose, scaling off ; leaves very densely beset with glandular dots, dark green above, subglabrous and glaucous beneath ; calyx very shortly campanulate, 5-dentate, tomentellous, green ; corolla somewhat salver-shaped, whitish ; the tube dilated above the base ; the lobes of the limb 5, long, lanceolate, obtuse, spirally convolute towards the left (as seen from above) in æstivation, at the time of the open flower soon corrugated and crisp ; stamens 5, inserted a little above the base of the corolla-tube, included ; filaments very thinly membranous, green ; anthers lance-shaped, with the rather broad connective agglutinated to the stigma, 2-celled, the cells bordering the more or less ovate-acuminate connective ; ovary globose, sessile, green, subbilobed ; styles 2, terminating in a large peltate-hemispherical glutinous stigma. In the shady primitive forests of Alto Queta, rare ; fl. middle of Jan. 1856. No. **5939**. A scandent, milky shrub. Queta mountains ; fl.-bud Feb. No. **5940**.

2. **C. triangularis** N. E. Br. in Journ. Linn. Soc. xxx. p. 92 (1894).

Pungo Andongo.—A twining, widely-climbing shrub, abounding in a blood-red resinous juice, with the habit of *Strophanthus intermedius* Pax ; leaves thinly and softly coriaceous, deep green without gloss above, greenish-yellowish beneath ; flowers pale orange-yellow ; scales of the corona 5, broadly triangular, horizontally declined, exactly closing the corolla-throat. By thickets in the deep valleys of the rocks of the præsidium ; fl. middle of Nov. 1856. No. **5993**.

There is in the study set a unique follicle, probably young, which is narrow, hooked at the tip, 1 in. long, and sparingly lepidote-puberulous.

3. **C. Welwitschii** Schlechter in Journ. Bot. xxxiii. p. 301 (1895).

Ectadiopsis Welwitschii Baill. *l.c.*, p. 82 (802); K. Schum. in Engl. Nat. Pflanzenfam. iv. 2, p. 219 (1895).

Huilla.—A shrublet, 1½ to 2½ ft. high, with white flowers. In thickets amongst short grass; fl. Dec. 1859. No. **4203**.

Var. **luteola**.

A subsarmentose shrublet, ½ to 1½ ft. high, with yellowish flowers.

Huilla.—In thickets near Huilla; fl. 14 Nov. 1859. No. **4205**.

4. **C. angolensis** Welw. ms. in Herb., sp. n.

A decumbent-sarmentose or rarely twining shrub, 2 to 4 ft. high, lactescent; rootstock woody; young radical shoots erect or ascending, virgate, orange-purplish or sub-cinereous, muriculate-puberulous, rather slender, leafy; leaves opposite, narrowly elliptical, narrowed towards both ends, subsessile, pointed at the apex, softly and thinly subcoriaceous, glaucescent at least beneath, pulverulent-puberulous along the veins and margin or subglabrous, entire on the narrowly revolute margin, 1 to 2 by ⅛ to ½ in. broad or rather more; lateral veins rather conspicuous, slender, arching and anastomosing near the margin, reticulate; nodes tumid; cymes dense, many-flowered, sessile or subsessile, in one axil each of the terminal and upper pairs of leaves; bracteoles small, rounded, ciliolate; flowers about ⅛ in. long, subsessile or on short rather thick pedicels, very agreeably fragrant like jessamine, blunt in the bud; calyx $\frac{1}{10}$ in. long, deeply 5-lobed; the segments oval, rounded at the apex, membranous on the margin, minutely pulverulent-puberulous, ciliolate, imbricate in æstivation; the short tube with 5 shorter trifid glands at the top inside alternating with the segments; corolla ⅛ in. long, white, not quite glabrous outside; the tube short; the lobes oval, thin along the margin; corona-scales subulate, filiform, arising from near the top of the corolla-tube, scarcely as long as its lobes; stamens glabrous, inserted below the corona-scales on the corolla-tube, distinct; filaments compressed, rather shorter than the deltoid subulate-tipped anthers.

Huilla.—In sandy thickets near Lopollo; fl. Jan. 1860. No. **4204**.

According to Welwitsch's ms. the plant is also met with near Pungo Andongo. A plant, collected by Schweinfurth, 10 July 1870, No. 4050, in Bongo-land, with narrowly lanceolate conical follicles 3 to 3¼ in. long and said to be a shrub of 2 to 4 ft. with yellow flowers, perhaps belongs to this species.

5. **C. myrtifolia**.

Ectadiopsis myrtifolia Baill., *l.c.*, p. 83 (803).

Huilla.—A low, sarmentose, twining shrub, or occasionally standing erect, lactescent, with white flowers. In thickets near Lopollo, plentiful; fl. No. **4206**.

6. **C. Brazzæi** Baill., *l.c.*, p. 83 (803).
Ectadiopsis lanceolata Baill., *l.c.* *C. Sizenandi* Rolfe in Bol. Soc. Brot. xi. p. 86 (1893).

Pungo Andongo.—Flowers white. In the thickets of the præsidium, plentiful ; fl. Feb. 1857. A form with long slender twining stems. No. **4197.**

Huilla.—Flowers white. At Monino ; fl. Dec. 1859. No. **4207.**

2. **TACAZZEA** Decaisne ; Benth. & Hook. f. Gen. Pl. ii. p. 745.

1. **T. Welwitschii** Baill. in Bull. Soc. Linn. Paris, No. 101, p. 87 (807) (1890).

Pungo Andongo.—An undershrub, 4 to 7 ft. high ; rootstock thick ; stems cæspitose, virgate, erect, slender, long, scarcely branched; fibre of the liber very thin, remarkably tenacious ; flowers paniculate, rosy purple or atropurpureous, scentless. In secondary wooded thickets between Luxillo and Cazella, abundant ; fl. and young fr. Jan. 1857. No. **4208.** At Quilanga ; fl. Feb. 1857. Less hairy than the type, with the aspect of *T. apiculata* Oliv. & Grant, but with the inflorescence denser than in the latter. No. **4210.**

Huilla.—Flowers purple. In the sandy wooded thickets of Catumba ; fl. April 1860. No. **4209.**

3. **RAPHIONACME** Harv.; Benth. & Hook. f. Gen. Pl. ii. p. 745.
Zaczatea Baill. in Bull. Soc. Linn. Par., No. 101, 86 (806) (1890).

1. **R. angolensis** N.E. Br. in Kew Bull. 1895, p. 248.
Zaczatea angolensis Baill., *l.c.*

Pungo Andongo.—A lactescent shrublet, sometimes erect, sometimes decumbent ; leaves hoary-glaucous ; flowers violet-coloured, at the base yellowish. On the more elevated of the gigantic rocks in the præsidium ; fl. Jan. 1857. No. **4201.** A shrub 1 to 2 ft. high ; stem decumbent below or even hanging down on the rocks, fleshy-woody, nodulose, purplish, viscid as well as the sub-succulent leaves ; flowers of a pleasant violet-purple colour. In clefts of the elevated rocks of the præsidium, in company with shrubby orchids and species of Velloziaceæ (cf. *Listrostachys fragrantissima* Reichenb. f., Welw. herb. nos. 701 and 702, and *Xerophyta squarrosa* Baker, Welw. herb. no. 1355 and Coll. Carp. n. 1006) ; fl. and young fr. Feb. 1857. No. **4202.**

The corona-scales are tripartite, the middle segment of each scale being long and subulate and the lateral segments short and semi-circular-deltoid.

2. **R. Welwitschii** Schlechter & Rendle in Journ. Bot. xxxiv. p. 97 (1896).

Ambaca.—A perennial herb, with a very large depresso-hemispherical copiously lactescent tuberous rootstock of 3 to 5 in. in diameter ; stems flagelliform, sometimes erect, sometimes twining and climbing ; flowers from whitish to purplish. In sandy wooded thickets between Hálo and Zamba ; fl. Oct. 1856. The tuber is figured in the notes accompanying the specimen. Welwitsch cultivated a plant of this for a long time in Loanda. No. **4234.** Seeds for cultivation and placenta of a climbing, opposite-leaved plant, a follicle of which was found in Quicombo de Hálo on the night of 8 June 1857 without any other parts of the plant ; follicle ventricose-lanceolate, not lactescent, 2 in. long, acuminate. Perhaps this species. Coll. Carp. 167. A

lactescent climber ; at Zamba, June 1857. The follicle measures about 3 in. in length. Possibly this species. Coll. Carp. 740. Dry stems with follicles only seen ; journey from Pungo Andongo to Ambaca at an elevation of 3500 ft., June 1857. Possibly this species. Coll. Carp. 155.

The next following No., in which the follicles measure $1\frac{1}{4}$ to $1\frac{5}{8}$ in. long by $\frac{1}{3}$ to $\frac{1}{2}$ in. thick and are puberulous and the leaves measure 2 to 3 in. long by $1\frac{1}{4}$ to $1\frac{1}{2}$ in. broad, should be compared with this species and also with *R. angolensis* Benth. & Hook. f. ex K. Schum. in Engl. Nat. Pflanzenfam. iv. 2, p. 221 (1895) :—

Pungo Andongo.—A copiously lactescent herb ; rootstock subtubercular, persistent ; stems climbing, 2 to 4 or even 5 but mostly only 2 ft. long, red ; leaves deep green above, velvety beneath ; flowers purple. In rocky places at Pedras de Guinga, very sparingly ; fl. and fr. March 1857. No. **4235**.

3. **R. globosa** K. Schum. in Engl. Bot. Jahrb. xvii. p. 118 (9 May 1893), & in Engl. Nat. Pflanzenfam. iv. 2, p. 221 (1895).

Huilla.—An erect lactescent herb, a foot high ; rootstock tuberous, perennial ; stems several, simple ; leaves opposite, lanceolate-linear, glaucescent-green, patent or even reflected ; flowers white, congested in a capitate manner at the apex of the stems. In secondary thickets near Lopollo, very rare ; fl. beginning of Dec. 1859. A unique specimen. No. **4178**.

4. **R. Loandæ** Schlechter & Rendle ms. in. herb. Mus. Brit.

A low, sparingly lactescent herb ; rootstock somewhat woody, persisting ; stems twining, slender, closely beset with short pallid hairs, somewhat branched ; branches patent, leafy ; leaves opposite, narrowly ovate elliptical or obovate, obtusely narrowed or rounded at the apex, wedge-shaped at the base, rather thickly herbaceous, deep green and scattered with short pallid curved hairs above, paler and more densely clothed with similar hairs beneath, undulate on the entire margin, sessile subsessile or shortly quasi-petiolate, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long by $\frac{1}{6}$ to $\frac{1}{3}$ in. broad ; inflorescence short, few-flowered, bracteate, about as long as the leaves, alternate, pendulous from the upper axils of the branches ; bracts ovate or lanceolate, $\frac{1}{10}$ in. long or less ; common peduncle and pedicels short or very short ; flowers herbaceous-green ; calyx widely campanulate, deeply 5-cleft, beset outside with short pallid spreading curved hairs, glabrous and shining inside, $\frac{1}{8}$ in. long ; the lobes acuminate from an ovate-oblong base ; unexpanded corolla $\frac{1}{4}$ in. long or rather more, scattered with short spreading pallid hairs outside, glabrous inside, somewhat salver-shaped, shortly 5-cleft ; the tube marked inside with 5 longitudinal ridges ; the lobes contorted in æstivation, extrorsely induplicate at the margin, obtuse ; corona-scales purple, tripartite, the central segment subulate, twice the length of the deltoid lateral segments ; stamens from whitish to rosy ; style bearded below the stigma, glabrous towards the base. Inside the base of the calyx there are glabrous, short, truncate, approximately placed glands or scales.

Loanda.—In dry hilly sparingly bushy places near Boa Vista, not far from the ocean; scarcely in good fl. middle of March 1858. No. **4274**.

4. **CHLOROCODON** Hook. f.; Benth. & Hook. f. Gen. Pl. ii. p. 745.

1. **C. Whiteii** Hook. f. in Bot. Mag. t. 5898 (1871); K. Schum. in Engl. Nat. Pflanzenfam. iv. 2, p. 215, fig. 64 (*Whitei*) (1895); *Periploca latifolia* K. Schum. in Engl. Pfl. Ost-Afrik., C, p. 321, & A, p. 94 (1895). *Chlorocodon* sp., Ficalho, Pl. Uteis, p. 223 (1884).

Golungo Alto.—Root the most aromatic of all the plants examined by Welwitsch in the interior of Angola, turning sweet when dry, called by the Portuguese colonists "Alcaçuz" (liquorice), and used when mixed with Xile or Abutua (*Tiliacora chrysobotrya* Welw.) as an emollient decoction; aroma like that of Canella; stem climbing far and wide, bent and twisted in various directions. In elevated places among the Queta mountains near Sange; in leaf, not yet in fl. June 1855. No. **4211**. A tall, climbing plant; root used like liquorice, with a peculiar aromatic sweet taste. In the dense forests on the northern sides of the Queta mountains; without fl. or fr. end of May 1855. Native name "Mulondo" or "Mundondo." No. **6013**. A climbing lactescent shrub, with a sweet root. Near Lendo, Cacusa-Sensala, Queta; without either fl. or fr. end of Aug. 1855. No. **4217**.

Pungo Andongo.—A shrub or rather a woody undershrub, climbing high and widely, lactescent; fibre very fine and tenacious, silvery-glossy; flowers violet-purple. By rocks along streams throughout the præsidium; fl. Jan. 1857. Native name "Mundondo" or "Jindondo." No. **4218**. A tall, climbing shrub, affording very tenacious fibre, with agreeably edible foliage and violet-coloured flowers. In the forests of Pungo Andongo, not uncommon but rather rarely flowering; fl. Jan. 1857. No. **4219**. A lactescent shrublet, elongate-scandent. In Barrancos de Songue, without either fl. or fr. April 1857. Probably this species. No. **4220**.

Bumbo.—A lactescent, twining shrub, climbing widely and high; root thick, succulent, with a very agreeable aromatic scent, and sweet taste as in *Glycyrrhiza*. Corolla greenish-livid outside, deep violet-purple inside; corona of the stamens duplex, green, the outer one with 5 lanceolate-linear erect scales, the inner one with 10 ovate-rounded patent appendages. In rocky places along the Bruco stream at an elevation of about 1500 ft., in dense forests climbing on *Eugenia benguellensis* Welw. herb. no. 4395, not uncommon; as yet sparingly in fl. towards end of Oct. 1859. The same plant occurs also in the districts of Golungo Alto, Cazengo, and Pungo Andongo. No. **4221**.

The determinations of the above-quoted Nos., so far as they are not accompanied with flowers, must be received with some doubt; for this species in most other respects bears a remarkably close resemblance to *Tylophora conspicua*, and is known in Golungo Alto by the same native name of "Mundondo." According to Welwitsch, Synopse Explic. p. 32, n. 79 & p. 42, n. 116, Mundondo grows in the dense forests of nearly all the mountainous districts from Alto Dande to Serra da Chella, and its leaves when cooked and treated with olive oil or butter afford a savoury substitute for spinach, and are so used both by the natives and by the Portuguese colonists; the more slender branches suitably macerated furnish excellent fibre for ropes, etc.; moreover, its

roots are distinguished by a peculiar lasting aroma and by a sweet and very agreeable taste, and when cooked are employed by the natives as a resolvent purgative in cases of cough and other chest affections; the root tastes quite like the liquorice of Europe, and is called by the Portuguese colonists mountain or wild liquorice. The fibre derived from the branches of this climber is not excelled in density elasticity or lustre by that of linen; and little else is used by the natives. The bark is sometimes mixed with that of *Croton Mubango* Muell. Arg. for the preparation of dressings that possess gently purgative qualities (see Ficalho, *l.c.*, p. 251).

There is in Coll. Carp. 733 a unique follicle of a climbing lactescent shrub, which grew at Mussengue in Golungo Alto in June 1856 and was called "Mundondo"; this follicle is $20\frac{1}{2}$ in. long, slender, subterete, $\frac{1}{4}$ in. in diameter near the base, tapering towards the apex, and glabrous.

5. **PERIPLOCA** Tournef., L.; Benth. & Hook f. Gen. Pl. ii. p. 746.

1. **P. nigrescens** Afzel. Stirp. Guin. Med. i. p. 2 (1818).

P. Preussii K. Schum. in Engl. Bot. Jahrb. xvii. p. 117 (1893).

Golungo Alto.—In thickets in Sobato de Mussengue, rather rare; fl. Feb. 1856. No. **4232**. Fl. No notes. No. **4225**.

6. **SECAMONE** R. Br.; Benth. & Hook. f. Gen. Pl. ii. p. 746.

1. **S. erythradenia** K. Schum. in Bot. Jahrb. xvii. p. 141 (1893).

Huilla.—A low, sarmentose, twining, lactescent shrub; leaves membranous, rather soft, yellowish green beneath; flowers white or green-yellowish, but little fleshy, nodding; corolla-lobes quite patent at the time of the open flower, quickly again connivent; stamens attached at the bottom of the corolla; filaments membranous, broad, a little cohering but not coalescent, forming a tube which includes the style; anthers apparently dehiscing transversely; style rather thick; stigma flattened, surmounted with a conical bilobed appendage; follicles lanceolate-conical, acuminate. In bushy wooded parts of Morro de Lopollo, on the side towards Humpata, plentiful; fl. Jan. 1860; fr. March, April and beginning of May 1860. No. **5941**.

2. **S. micrandra** K. Schum., *l.c.*, p. 142.

Golungo Alto.—A lactescent shrub, climbing widely and to a great height on trees; stem twining; flowers yellowish. In dense forests in Sobato Quilombo; fl. Feb. 1855. No. **5942**.

3. **S. platystigma** K. Schum., *l.c.*, p. 143.

Golungo Alto.—A tall, climbing, lactescent shrub; branches quite patent; bark orange-yellow. In dense forests near Cambondo towards the river Luinha; fl. Jan. 1855. No. **5935**. A scandent, twining, lactescent shrub, the sarmentose branches at length pendulous; flowers yellowish. In the primitive forests of Sobato Cabanga Cacalunga, rather rare; fl. Feb. 1855. No. **5936**. A climbing shrub, with yellowish flowers. Mussengue roadway; fr. June 1856. No. **5937**. At N-delle; fl. June 1855. No. **5943**. A shrub, climbing high and widely, abounding in a bitter milky juice; flowers yellow, but little fragrant. In dense forests near Cambondo; fl. Jan. 1856.

No. **5944**. A lactescent shrub, climbing high and widely, with yellowish flowers. In the primitive forests of Quilombo Quiacatubia; fl. Feb. 1855. No. **5945**. A climbing, sparingly lactescent shrub; leaves evergreen, softly coriaceous, glossy, pallid beneath, pinnately striate; flowers rather fleshy, yellowish, but little fragrant; calyx green, with imbricate very obtuse segments; corolla white-yellowish outside, yellow inside; stamens inserted at the bottom of the corolla; anthers bearded at the apex; stigma clavate-capitate, whitish, exceeding the anthers; hypogynous scales erect, lanceolate-linear, a little shorter than the row of anthers. By thickets in Sobato de Mussengue; fl. middle of Feb. 1856. No. **5946**.

Ambaca.—A tall climbing lactescent shrub, with coriaceous glossy leaves. In bushy wooded places by streams between Izanga and N-gombe; without either fl. or fr. Oct. 1856. Apparently this species. No. **5948**.

Pungo Andongo.—No notes. Fl. No. **5947**.

The next following No. should be compared with this species:—

Pungo Andongo.—A slender, widely climbing shrub, lactescent, with whitish flower-buds. In bushy places at the outskirts of the primitive forest in the præsidium, apparently sporadic; only once seen though subsequently searched for; fl.-bud Feb. 1857. No. **1237**.

7. **XYSMALOBIUM** R. Br.; Benth. & Hook. f. Gen. Pl. ii. p. 752.

1. **X. angolense** Elliot in Journ. Bot. xxviii. p. 365 (1890).

Huilla.—A herb; rootstock tuberous; stems numerous, 1 to 2 ft. high, erect, very loosely filled with a spongy pith, pubescent; leaves numerous, pubescent; calyx very pale yellow; corolla-lobes sordid-violet coloured outside, whitish and bearded inside; corona of the stamens and the stigma violet-coloured. In swampy places along streams near Huilla, plentiful, fl. 20 Nov. 1859; in damp meadows near Humpata, fr. April 1860. No. **4170**. In the damp pastures of Catumba towards Ohai: fl. Feb. 1860. No. **4171**.

2. **X. decipiens** N. E. Br. in Kew Bull. 1895, p. 250.
X. Holubii Elliot, *l.c.*, pro parte.

Huilla.—Flowers whitish-lilac. In hilly bushy and grassy places near Lopollo, rather rare; fl. Dec. 1859. No. **4175**.

3. **X. fritillarioides** Rendle in Journ. Bot. xxxii. p. 162 (1894).

Huilla.—A herb; rootstock woody, perennial; stem slender, 1½ ft. high; leaves opposite, linear, herbaceous green; flowers green-yellowish, comparatively large, almost resembling those of a *Fritillaria*. In thickets between Mumpulla and Humpata, apparently very rare; fl. Oct. 1859. No. **4179**.

4. **X. rhomboideum** N. E. Br., *l.c.*, p. 251.

Huilla.—Flowers sordid, coloured white-violet. In sandy pastures amongst low bushes, near Ferrão da Sola; fl. Jan. 1860. No. **4193**.

5. **X. andongense** Hiern, sp. n.

An erect, robust herb; stem about 1½ ft. high or more, apparently simple, pubescent somewhat sinuous and compressed above, puberulous and terete below, leafy throughout, often transversely lined at the nodes; leaves opposite, oval or oblong,

rounded emarginate and mucronulate at the apex, cordate and subsessile at the base, thinly fleshy-coriaceous, mostly nearly glabrous, $1\frac{1}{2}$ to 3 in. long by $\frac{1}{2}$ to $1\frac{1}{2}$ in. broad; venation delicate, anastomosing; petiole broad, very short, not decurrent, often puberulous; umbels lateral and sessile or in a terminal axil and pedunculate, 3- to 5-flowered, about an inch in diameter; pedicels and peduncle shortly pubescent, $\frac{1}{4}$ to $\frac{1}{2}$ in. long; bracts subulate, ciliolate, about $\frac{1}{8}$ in. long; sepals 5, $\frac{1}{4}$ in. long, lanceolate, green, minutely glandular on the back, ciliolate; corolla deeply 5-lobed, the lobes broadly oval-ovate, $\frac{1}{4}$ in. long, minutely glandular on both faces, apparently greenish on the back, ciliolate; corona inserted at the base of the staminal tube, consisting of 5 segments, each fleshy, about $\frac{1}{6}$ in. long, not hooded but thick-margined, obtusely keeled on both faces near the apex, the keel terminating rather below the middle in a rounded tubercle, on each side of which is a similar tubercle terminating a lateral horizontal thickening or fold proceeding from the lateral margin; anther-appendages membranous, inserted at the apex of the anthers just above the level of the top of the corona; stigma obtuse, not prominent, emarginate at the apex.

PUNGO ANDONGO.—No notes. In fl. No. **4189**.

In general appearance this plant somewhat resembles *X. rhomboideum* N. E. Br., but differs by the subsessile foliage, etc.

8. **ODONTOSTELMA** Rendle in Journ. Bot. xxxii. p. 161, t. 344.

K. Schumann in Engl. Nat. Pflanzenfam. iv. 2, p. 305 (1895) has suggested that this genus should be united with *Schizoglossum*.

1. **O. Welwitschii** Rendle, *l.c.* (1894).

HUILLA.—Flowers greenish. In sparingly bushy pastures near Lopollo; fl. Dec. 1859 and Jan. 1860. No. **4172**.

9. **SCHIZOGLOSSUM** E. Mey.; Benth. & Hook. f. Gen. Pl. ii. p. 753.

1. **S. fusco-purpureum** Schlechter & Rendle in Journ. Bot. xxxiv. p. 98 (1896).

HUILLA.—A slender, lactescent herb, a foot high; rootstock conical-tuberous; leaves filiform; flowers rather small, dusky purple. In a rather dry sandy thicket near Huilla, sparingly; fl. Nov. 1859. No. **4177**.

2. **S. angolense** Schlechter & Rendle, *l.c.*

HUILLA.—Flowers greenish. In sparingly bushy pastures near Lopollo, sporadic; fl. Dec. 1859. No. **4173**.

10. **ASCLEPIAS** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. p. 754.

Gomphocarpus R. Br. (1809); Benth. & Hook. f., *l.c.*, ii. p. 753. As to the necessity of combining these two considerable genera, see Schlechter in Journ. Bot. xxxiii. p. 334 (1895), who in Journ. Bot. xxxiv. p. 451 includes also *Xysmalobium* in the same combination.

1. **A. curassavica** L. Sp. Pl., edit. 1, p. 215 (1753).

CAPE DE VERDE ISLANDS.—A simple herb, $1\frac{1}{2}$ ft. high, with orange-

red flowers. By a stream on the higher parts of Monte Verde in St. Vincent, wild, perhaps not indigenous ; fl. Aug. 1853. No. **4181**.

According to a note of Welwitsch the root is somewhat drastically purgative.

2. **A. firma** Schlecter ms. in Herb. Mus. Brit.

Schizoglossum firmum N.E. Br. in Kew Bull. 1895, p. 252.

Huilla.—Corolla whitish violet in colour. In the higher moist thickets near Lopollo ; fl. Jan. 1860. No. **4191**.

The corona has its lateral margins broadly inflected with a slight keel along the lines of folding and another keel down the inflected portions ; each of the inflected portions has an erect rounded terminal lobe approximated to that of the other inflected portion ; the pollen-masses are almost discoid and agree with those of *Asclepias*.

3. **A. Frederici** Hiern, sp. n.

A slender shrub, loosely or sparingly branched from the base upwards, 3 to 5 ft. high or rarely taller ; branches spreading, subterete, smooth, dusky ; branchlets more or less spreading, softly white-tomentose, leafy, fistular ; leaves opposite or the upper ones crowded, elongate-linear, pointed at the apex, somewhat wedge-shaped towards the sessile or subsessile base, dry-fleshy, grass-green, sparingly hairy or nearly glabrescent above, more or less clothed with whitish hairs beneath, revolute along the lateral margins, 1 to 4 in. long by $\frac{1}{16}$ to $\frac{1}{6}$ in. broad, uninerved or with 1 or 2 very slender nerves beneath on each side of the midrib ; flowers greenish-yellowish ochroleucous or sulphur-coloured ; pedicels tomentose or pilose with white hairs, slender, umbellate, 4 to 6 together, $\frac{1}{3}$ to $\frac{5}{6}$ in. long ; common peduncle lateral to the axils, tomentose or pilose, about as long as the pedicels ; sepals spreading or reflected, lanceolate, acute, $\frac{1}{8}$ in. long, pale green, pilose on the back ; corolla deeply lobed, the lobes broadly ovate, scarcely acute, pilosulous on the back, $\frac{1}{3}$ in. long, spreading or reflected, glabrous or minutely glandular in front ; andrœcium $\frac{1}{6}$ in. long ; corona-scales $\frac{1}{8}$ in. long, reaching as high as the anthers, induplicate, subquadrate as folded, with straight vertical inner margins, curved along the top entire margins, keeled along the back and base to the attachment with the staminal column, and usually with an erect short lobule or tooth at the apex of each or one inner side ; anther-tip appendages membranous, ovate-deltoid, incurving ; follicles inflated, oblong-spherical, sulphur-coloured, spotted with purple, aculeate, $1\frac{1}{2}$ to 2 in. long, pilose ; prickles weak, pilosulous, violet-purple.

Pungo Andongo.—A lovely shrub, 3 to 5 ft. high, rarely more, branched from the base ; leaves rather fleshy, grass-green ; flowers sulphur-yellow ; follicles oblong-spherical, sulphur-yellow spotted with purple, beset with weak violet-purple prickles. On the more elevated ranges of the rocks in the præsidium where it is a shrublet of 2 ft. in height, in the deep valleys 4 to 5 ft : fl. and fr. end of Nov. 1856. No. **4160**. A loosely branched elegant shrub, 4 to 5 ft. high ; flowers green-yellowish. On the tops of the rocks of the præsidium, plentiful ; fl. Dec. 1856 ; fr. March 1857. No. **4161**. A slender shrub, 3 to 5 ft. high ; branches sparse, spreading ; leaves dryly rather

fleshy ; flowers ochroleucous. In the more elevated rocky parts of Pungo Andongo ; fl. Dec. 1856 and Feb. 1857. No. **4162**. On the tops of the rocks of Pedra de Cabondo, at an elevation of 3500 ft. : fl. April 1857. No. **4163**.

Huilla.—Flowers whitish-yellowish. In the rocky thickets of Lopollo ; fl. Jan. 1860. No. **4166**.

This plant is nearly related to *A. flavida* N.E. Br. in Kew Bull. 1895, p. 255 (Oct. 1895), a species from Somali-land, but differs from it by the scarcely acute corolla-lobes pilose on the back and by the straight and erect rather than falcate and abruptly reflected teeth on the inner angles of the folded corona-scales. It differs from *Gomphocarpus tomentosus* Burch. by the inflated fruit.

4. **A. denticulata** Schlechter in Journ. Bot. xxxiii. p. 334 (1895).

Libongo.—An undershrub, 3 to 4 ft. high, sparingly branched, erect ; leaves glaucous-green ; flowers whitish ; follicles green, obovoid-globose, in old age turning pale yellow. In swampy places about the lake on the right bank of the river Lifune, near the plantations of Senhor Freire ; fl. and fr. Sept. 1858. No. **4159**. A copiously lactescent, sparingly branched, narrow-leaved shrub of 3 to 4 ft., with white flowers. In damp places about the lake near Libongo ; fr. Sept. 1858. Coll. Carp. 127.

Golungo Alto.—A perennial herb, 3 to 4 ft. high ; leaves sub-coriaceous, succulent, glaucous-green ; flowers white, as in *A. fruticosa*. In marshy parts of palm-groves composed of *Raphia textilis* Welw. (herb. no. 6671), on the right bank of the river Quiapoze ; roadway near Menha Lula ; fl. Jan. 1855 ; fl. and fr. Feb. 1855. No. **4158**.

5. **A. fruticosa** L. Sp. Pl., edit. 1, p. 216 (1753).

Gomphocarpus fruticosus Ait. Hort. Kew., edit. 2, ii. p. 80 (1811).

Mossamedes.—An erect undershrub : stems several, 4 to 5 ft. high : flowering branches erect-speading ; leaves herbaceous, deep green : flowers whitish. In sandy thickets at the banks of the rivers Bero and Giraûl, very plentiful ; fl. and fr. June to Aug. 1859. No. **4164**. Apparently an undershrub although 4 to 6 ft. high, for the stems perish nearly to the rhizome each year ; flowers whitish. In moist bushy places at the margins of the river Bero near Cavalheiros, etc. : fl. and young fr. June 1860. No. **4165**.

6. **A. semiamplectens**.

Gomphocarpus semiamplectens K. Schum. in Engl. Bot. Jahrb. xvii. p. 128 (9 May 1893).

Pungo Andongo.—An erect, sparingly branched, very lactescent herb, 2 to 2½ ft. high, with the habit quite of a large *Cerinthe* ; root napiform ; branches erect-spreading ; leaves broadly ovate, cordate, secund, adpressed to the stem, glaucous-shining ; pedicels reddening ; flowers nodding : the calyx and lobes of the corolla yellowish green ; staminal corona yellowish ; follicles inflated, ovoid, nearly glabrous. In a sandy wooded thicket near Cazella, plentiful but only in one place : fl. and fr. beginning of Jan. 1857. No. **4188**.

7. **A. lineolata** Schlechter, *l.c.*, p. 336.

Gomphocarpus lineolatus Decaisne in Ann. Sc. Nat., sér. 2, ix. p. 326 (1838). *G. bisacculatus* Oliv. in Trans. Linn. Soc., ser. 2, ii. p. 341 (Oct. 1887).

Cazengo.—An erect, lactescent herb, 2 to 2½ ft. high ; root

tuberous ; leaves rather rigid, glaucous ; flowers rosy-peach-coloured. In rocky thickets on the left bank of the river Luze, sparsely ; fl. Dec. 1854. No. **4182**.

Pungo Andongo.—A very lactescent, erect herb ; root tuberous ; leaves rigid, glaucous ; flowers of a very pleasant violet-purplish colour. In open thickets at the banks of the river Luxillo, behind the bridge, abundant ; fl. Jan. 1857. No. **4183**. An erect stiff lactescent herb, sparingly or somewhat branched ; root tuberous ; flowers whitish. On the elevated rocks of the præsidium, Pedra de Cazella, plentiful ; fl. Jan. 1857. No. **4184**. A perennial herb ; root-tubers elongate-oblong ; stem erect, 2 ft. high ; leaves coriaceous, rough, glaucous-green ; flowers of a very pleasant flesh-rosy colour, at length turning rosy-purple. In rather dry thickets on the left bank of the river Luxillo from Pungo Andongo towards the district of Cambamba, sparingly ; fl. April 1857. Also occasionally but rarely met with in the district of Ambaca. No. **4185**. An erect herb, 3 to 4 ft. high, copiously lactescent in all parts ; stem petioles and peduncles softly shaggy ; flowers milk-white. In wooded pastures on the right bank of the river Cuanza, sporadic ; fl. middle of Nov. 1856. No. **4186**. A very lactescent, glaucous-green herb, 2 to 3 ft. high, with whitish flowers. In thickets among sparse trees between Caghuy and the river Cuanza ; fl. end of Nov. 1856. No. **4187**.

Huilla.—A succulent herb, 2 to 2½ ft. high, with rosy flowers. In bushy places between Eme and Quipungo, rather rare ; fl. Jan. 1860. No. **4192**.

8. **A. palustris** Schlechter, *l.c.*, p. 336.

Gomphocarpus palustris K. Schum., *l.c.*, p. 127.

Pungo Andongo.—An erect herb ; root with oblong tuberous enlargements on its divisions ; flowers pale rosy. On the more elevated bushy parts of the gigantic rocks of the præsidium, rather rare ; fl. Dec. 1856. No. **4167**.

9. **A. Schumanniana**.

Gomphocarpus amœnus K. Schum., *l.c.*, p. 124.

Pungo Andongo.—A herb with a napiform root, glaucous-green foliage, and deep violet-rosy flowers. In the more elevated thickets of the præsidium, on Pedra de Cazella, sporadic ; fl. Dec. 1856 and Jan. 1857. No. **4169**.

10. **A. foliosa**.

Gomphocarpus foliosus K. Schum., *l.c.*, p. 126.

Huilla.—Flowers of a rosy violet colour. In pastures among sparse bushes, near Lopollo, rare ; fl. Dec. 1859. No. **4174**.

The next two Nos., with alternate or scattered rather than opposite leaves, possibly belong to a species of *Asclepias* :—

Pungo Andongo.—A lactescent herb ; root tuberous, large, napiform ; leaves alternate. In pastures near Calundo, never seen in fl. Jan. and March 1857. No. **4236**. A tuberous, lactescent herb. In rocky pastures near Candumba at the river Cuanza, rather rare ; without fl. March 1857. No. **6742**.

11. **STATHMOSTELMA** K. Schum. in Engl. Bot. Jahrb. xvii. p. 129, t. 6 (1893).

1. **S. incarnatum** K. Schum., *l.c.*, p. 130.

HUILLA.—Flowers brilliantly blood-red. At the Mumpulla lake ; fl. Oct. 1859. No. **4176**.

In the study set there is a follicle measuring rather more than 3 in. long by ¼ in. broad.

2. **S. Welwitschii** Britten & Rendle in Trans. Linn. Soc., ser. 2, iv. p. 28, in note (1894).

Asclepias Welwitschii Britten & Rendle, *l.c.*

PUNGO ANDONGO.—A very lactescent herb; root tuberous, napiform, hard, perennial ; stem erect, branched, 2½ to 4 ft. high; leaves greenish, somewhat glaucescent and fleshy ; flowers resembling those of a *Chironia*, very deep orange in colour. In the more elevated sandy thickets near Pedras de Guinga, very rare ; fl. Jan. 1857. No. **4168**. In the study set there is a specimen with a single flower from the same locality, apparently of this species. No. **4168***b*.

12. **CALOTROPIS** R. Br.; Benth. & Hook. f. Gen. Pl. ii. p. 754.

1. **C. procera** Ait. Hort. Kew., edit. 2, ii. p. 78 (1811) ; Schmidt, Fl. Cap. Verd. p. 215 (1852); Ficalho, Pl. Uteis, p. 222 (1894).

Asclepias procera Ait. Hort. Kew., edit. 1, i. p. 305 (1789).

CAPE DE VERDE ISLANDS.—A fleshy, copiously lactescent, glaucous shrub, 4 to 6 ft. high, sparingly branched from the base ; flowers whitish purple. In cultivated as well as in uncultivated places along the skirts of fields, etc., near Cidade da Praia in St. Jago, where it is called "Bombardeira" by the inhabitants ; fl. and fr. Jan. 1861. No. **4180**. A perennial plant, 4 to 8 ft. high, remarkably ornamental in the level spaces ; stem straight, branched ; leaves very large, glaucous ; flowers rosy-white. In the island of St. Jago ; fr. beginning of Jan. 1861. COLL. CARP. 21.

13. **PENTARRHINUM** E. Mey. ; Benth. & Hook. f. Gen. Pl. ii. p. 758.

1. **P. insipidum** E. Mey. Comment. Pl. Afr. Austr. p. 200 (1837) ; Harv. Thes. Cap. i. p. 7, t. 11 (1859).

AMBRIZ.—Quizembo ; fl. Nov. 1853. No. **4199**.

ICOLO E BENGO.—A twining herb, with bright green thinly rather fleshy foliage and white flowers. Near the Lagôa de Foto, tolerably abundant ; fl. Sept. 1857. No. **4240**.

LOANDA.—A lactescent, twining herb ; stems widely and intricately climbing but scarcely more than 6 ft. high ; leaves cordate, glaucous-green, soft ; flowers white ; follicles rarely seen, ovoid-conical, blunt. By and in thickets near Penedo ; fl. end of April 1858 ; fr. July 1854 and July 1858. No. **4237** and COLL. CARP. 736.

GOLUNGO ALTO.—A climbing lactescent undershrub, with white flowers. At Elinda grande in Terras de Bumba ; fl. May 1855. No. **4238**. A tender, lactescent, climbing herb ; leaves herbaceous-green. but little glaucescent, soft, flaccid ; calyx green ; corolla also herbaceous-green, at the time of the open flower rotately patent ; staminal corona brilliantly white, rather fleshy ; the segments 5, lanceolate, acuminate, involute at the apex and at the lateral margins near the base. At the outskirts of forests along the banks of the river Quiapose, rather rare ; fl. March 1856. No. **4239**.

BUMBO.—Flowers white. In the rocky thickets of Nene towards Empalanca ; fl. end of March 1860. No. **4247**.

The seeds much resemble those of *Cynanchum polyanthum*, a plant of a very similar habit.

14. **GLOSSOSTELMA** Schlechter in Journ. Bot. xxxiii. p. 321.

1. **G. angolense** Schlechter, *l.c.*, p. 322. t. 352, B.

Pungo Andongo.—A strictly erect, simple, copiously lactescent herb, 3 ft. high or rather more; root tuberous; stem woody at the base; leaves rigidly coriaceous, glaucescent, the largest in the middle of the stem, gradually smaller towards both ends especially towards the base of the stem; flowers fleshy, green-purplish. In the Panda forests near Mangue, very rare; one specimen fl. Jan. 1857 No. **4190**.

15. **CYNANCHUM** L.; Benth. & Hook. f. Gen. Pl. ii. p. 762.

1. **C. schistoglossum** Schlechter in Journ. Bot. xxxiii. p. 271 (Sept. 1895).

C. brevidens N. E. Br. in Kew Bull. 1895, p. 257 (Oct.). *C. vagum* N. E. Br., *l.c.*

Golungo Alto.—A widely climbing lactescent shrub; leaves green, scarcely glaucous but not lurid; petals herbaceous-green, the rest of the organs of fructification whitish-yellowish. By thickets along the base of the mountains of Alto Queta; fl. middle of Oct. 1855. No. **4243**. Flowers whitish, very small. At Ponte de Felix Simões; fl. June 1856. No. **4241**. No notes. Fl. No. **5949**.

Huilla.—A lactescent, twining herb of 3 to 4 ft.; root tuberous; leaves herbaceous-green, cordate-ovate or -lanceolate; flowers whitish-greenish, calyx green; corolla, etc., yellowish. In moist thickets near Lopollo; fl. Jan. 1860. No. **4251**.

2. **C. obscurum** K. Schum. in Engl. Nat. Pflanzenfam. iv. 2. p. 253 (May 1893).

C. mossambicense Schlechter in Journ. Bot. xxxiii. p. 337 (1895), non K. Schum. *C. Welwitschii* Schlechter & Rendle in Journ. Bot. xxxiv. p. 99 (1896).

Golungo Alto.—A glaucous-green, twining, widely climbing, lactescent herb; leaves rather fleshy, soon becoming flaccid, bright green above, pallid beneath; petals sordid violet-coloured; follicles solitary, conical-pyramidal, trigonous; one of the angles very blunt, two of them sharp. By thickets in Sobato de Mussengue, not abundant, in company with *Tragia volubilis* L. var. *genuina* Muell. Arg. (Welw. herb. no. 382); fl. and fr. end of Nov. 1855. No. **4222** and Coll. Carp. 737. No notes. Fl. No. **4200**. A suffrutescent, twining herb, with sordid violet-coloured flowers and studded petals. In the forests of Sobato de Mussengue: ripe fr. beginning of Aug. 1856. No. **4253** and Coll. Carp. 738. A climbing, lactescent shrublet. Quilombo Quiacatubia; without either fl. or fr. Feb. 1855. Apparently this species. No. **4224**. Between Quibinda and Ambaca. The unique follicle measures rather more than 3 in. in length. Coll. Carp. 739.

16. **SARCOSTEMMA** R. Br.; Benth. & Hook. f. Gen. Pl. ii. p. 763.

1. **S. nudum** Chr. Sm. in Tuckey, Congo, p. 251 (1818) (nomen); Webb in Hook. Niger Fl. p. 149 (1849).

S. Daltoni Decaisne ex Webb, *l.c.*, p. 149. t. 14; J. A. Schmidt, Fl. Cap. Verd. Ins. p. 214 (1852).

Cape de Verde Islands.—On the rocks of Monte Verde in the island of St. Vincent, about 1000 ft. alt.; and also at the coast on St. Jago, where it is very plentiful and called by the inhabitants "Tosta-Olho"; fl. Sept. 1853. It hangs from the rocks and looks at a distance like a spider's web; it yields much milk, and on that account is regarded as poisonous. No. **4258**.

Perhaps not specifically distinct from the next species.

2. **S. viminale** Br. Prodr. Fl. Nov. Holl. p. 464 (1810).
Euphorbia viminalis L. Sp. Pl., edit. 1, p. 452 (1753).

Ambriz.—A fleshy, jointed, leafless, glaucescent shrub, with ochroleucous-whitish flowers. At Quilombo in the Mossul principality; fl. and fr. Nov. 1853. No. **4255**.

Loanda.—A leafless, slender, glaucous-green shrub, 3 to 5 ft. high, scandent, occasionally twining, fleshy throughout; juice milky, thick; branches cylindrical, jointed; branchlets twisted into a loose spike; flowers of a pale sulphur colour or whitish-ochroleucous, cymose or umbellate and mostly lateral, readily deciduous; follicles geminate, lanceolate-linear, acute, smooth. In thickets about Loanda, Cacuaco, etc., in dry places, rather rare; at Museque de Luiz Gomes; fl. March and April 1854. No. **4256**.

3. **S. andongense** Hiern, sp. n.
Sarcostemma sp., Welw. in Journ. Linn. Soc. iii. p. 154 (Feb. 1859).

A very lactescent, fleshy shrub, decumbent or rarely pendulous, 4 to 8 ft. long or more; branches sometimes rambling, sometimes opposite or verticillate, cylindrical, glaucescent, glabrous or nearly so; sessile umbels lateral and terminating the branchlets, subglobose, about an inch in diameter; pedicels several together, spreading, puberulous, $\frac{1}{4}$ to $\frac{3}{8}$ in. long; flowers about $\frac{1}{2}$ in. in diameter when fully expanded; sepals very small, lanceolate, puberulous; corolla 5-partite, nearly glabrous, minutely squamulose-glandular on the back, from greenish to pale sulphur in colour; the segments narrowly ovate or oval-oblong, obtuse, at length spreading, about $\frac{1}{4}$ in. long; corona white; the outer whorl about $\frac{1}{6}$ in. high, shortly toothed; the inner whorl of the corona staminal, consisting of 5 triangular lobes about $\frac{1}{16}$ in. long arising from the andrœcium near the level of the apex of the outer whorl and falling short of the tip of the stigma; anthers tipped with erect lanceolate-triangular appendages; stigma ovoid-conical.

Pungo Andongo.—In the more elevated rocky places in the præsidium, almost everywhere and very plentiful, in company with fleshy orchids (cf. *Listrostachys fragrantissima* Reichenb. f.; Welw. herb. nos. 701, 702); fl. end of Dec. 1856. No. **4257**.

4. **S. Welwitschii** Hiern, sp. n.

Stems fleshy, glaucescent, brittle, cylindrical, glabrous or minutely squamulose-glandular, dichotomously or trichotomously branched, climbing far and widely, twining towards the tapering extremities, leafless; sessile umbels lateral and terminating the short branchlets, several-flowered, about $\frac{3}{4}$ in. in diameter; pedicels $\frac{1}{5}$ to $\frac{2}{3}$ in. long, somewhat puberulous, spreading or recurving;

flowers from whitish to yellowish, about $\frac{1}{2}$ in. in diameter when fully expanded; sepals 5, ovate, obtuse, about $\frac{1}{20}$ in. long, somewhat pubescent at the back near the base; corolla 5-partite, the segments $\frac{1}{4}$ in. long by $\frac{1}{8}$ in. broad, oval, rounded at the apex, glabrous or minutely glandular; corona double; the outer whorl hemispherical, $\frac{1}{8}$ in. in diameter, $\frac{1}{16}$ in. high, with short vague lobes or nearly entire; the inner whorl of the corona consisting of 5 triangular lobes inserted on the androecium at about the level of the top of the outer corona, $\frac{1}{20}$ in. long, extending about as high as the anther-appendages, rather exceeding the shortly apiculate stigma; follicles narrowly lanceolate-conical, $2\frac{3}{4}$ to $3\frac{3}{4}$ in. long, nearly glabrous and smooth, spreading or pendulous; seeds compressed, ovate or oblong-ovate, $\frac{1}{6}$ in. long, rounded at the base, truncate at the apex where it has a silky whitish very pallid tawny spreading coma about an inch long.

Huilla.—In rocky thickets at the base of Morro de Lopollo; fl. and fr. Dec. 1859 and Jan. to March 1860. No. **4261**.

This species should be compared with *S. brachystigma* Hook. Ic. Pl. t. 861 (1852) = *S. Stocksii* Hook. f. Fl. Brit. Ind. iv. p. 27 (1883), which it resembles in the characters of the corona and stigma; it differs, however, in the smaller number of the rather larger flowers in each umbel. It is probably the same species as the *Sarcostemma* collected by G. Don at Sierra Leone and mentioned by Bentham in Hook. Niger Fl. p. 454 (1849) as difficult to distinguish from *S. brevistigma* Wight & Arn.

The next following No. perhaps belongs here:—

Mossamedes.—Frutescent, 3 or rarely 4 to $4\frac{1}{2}$ ft. high, dichotomously branched from the base, cæspitose in clumps of 3 to 4 ft. in diameter; stems and branches cylindrical, dichotomous, jointed, covered with a farinaceous glaucous deciduous bloom, sheathed at the nodes with a gold-coloured band or ring; follicles linear-lanceolate, nearly smooth, erect or at length (after the release of the seeds and placenta) pendulous, always terminal on the branches or branchlets, 5 to $5\frac{1}{2}$ in. long. On dry slopes, in other respects quite barren, of Serra de Montes Negros, near Mossamedes, at a distance of 6 miles from the coast towards the east, very abundant; with dehisced fruit 10 Aug. 1859. No. **4260**.

The following should also be compared with this species, but the fruit is shorter and thicker:—

Mossamedes.—A leafless, suberect shrub; the numerous stems and branches virgate, glaucescent; flowers whitish-yellowish. In rocky places near the citadel of Mossamedes; fr. June 1863. The spindle-shaped follicles measure 2 to $2\frac{1}{2}$ in. long, $\frac{1}{2}$ to $\frac{1}{3}$ in. broad, $\frac{2}{3}$ to $\frac{1}{2}$ in. thick; the seeds are $\frac{1}{5}$ in. long with a brittle coma. Coll. Carp. 732.

This is the *Sarcostemma* referred to in Journ. Linn. Soc. v. p. 185 (1861).

17. **DŒMIA** Br.; Benth. & Hook. f. Gen. Pl. ii. p. 764 (*Dœmia*).

1. **D. extensa** Ait. Hort. Kew., edit. 2, ii. p. 76 (1811 (*Dœmia*). *Cynanchum extensum* Jacq. Misc. Austr. ii. p. 353 (1781).

Golungo Alto.—A widely climbing herb, leaves green, paler beneath: pedicels of a pale straw colour; flowers white. By thickets

near Muria; fl. Sept. 1855; also at the outskirts of the forest between Muria and Trombeta, rather sparingly; fl. 18 Sept. 1854. Found also near Sange. The best time for its flowering is April and May. No. **4244**. A widely climbing, twining, lactescent undershrub or herb; leaves cordate; flowers white; follicles divaricate, beset with herbaceous prickles. In thickets by the king's highway near Sange, by Ponte de Luiz Simões, plentiful; fr. July 1857. COLL. CARP. 162.

MOSSAMEDES.—A perennial, extensively climbing, twining, copiously lactescent, glaucous-green herb; peduncles elongated, umbelliferous; pedicels pendulous; flowers purplish; follicles geminate, elongated, ovoid-lanceolate, falcate, compressed-cylindrical, gradually subulate towards the apex, greenish, muriculate, pilose-subhispidulous in parts. In sandy thickets at the banks of the river Bero, plentiful; fl. and fr. end of July 1859. No. **4246**.

This is the Asclepiad mentioned and shortly described by Welwitsch, Apontam. p. 590. n. 90 (1859).

18. **GYMNEMA** Br.; Benth. & Hook. f. Gen. Pl. ii. p. 769.

1. **G. geminatum** Br. Prodr. Fl. Nov. Holl. p. 462 (1810).

Periploca sylvestris Retz, Obs. Bot. ii. p. 15 (1781) *G. sylvestre* Schultes, Syst. Veg. vi. p. 57 (1820).

PUNGO ANDONGO.—A shrublet, spread on the ground or twining and climbing after the manner of species of *Sarcostemma*, with one of which it was in company. On lofty ledges of the gigantic rocks of the præsidium, Pedra Songue; fl. Feb. 1857. No. **4198**.

HUILLA.—A climbing or sarmentose shrub, with tortuous branches and whitish-yellowish flowers. In thinly wooded parts of Morro de Lopollo, at Ferrão da Sola; fl. Dec. 1859 and Feb. 1860, fr. April 1860. No. **4242**.

19. **TYLOPHORA** Br.; Benth. & Hook. f. Gen. Pl. ii. p. 770.

1. **T. sylvatica** Decaisne in Ann. Sc. Nat., ser. 2, ix. 273 (1838).

Vincetoxicum sylvaticum O. Kuntze, Rev. Gen. Pl. ii. p. 425 (1891).

GOLUNGO ALTO.—A very lactescent herb, with atropurpureous flowers. At the outskirts of palm groves near Sanches, sparingly; fl. Feb. 1855. No. **4230**. In thickets in the Sange country; fl. and fr. No. **4231**.

2. **T. conspicua** N.E. Br. in Kew Bull. 1895, p. 258.

GOLUNGO ALTO.—A slender, widely climbing, lactescent shrub; stems virgate-sarmentose, very tenacious, affording a fibre well adapted for making ropes; flowers purple. In the primitive forests of Sobato Mussengue and at Sange; fl. Oct. 1856. Branchlets patent. No. **4212**. A twining, lactescent, suffruticose herb, with sordid atropurpureous flowers. By thickets in Sobato Bumba, near Sange, rather rare; fl. March 1855. No. **4214**. A shrub, climbing high and widely; root officinal; leaves edible, membranous, deciduous; juice watery-viscid; follicles greenish, smooth, angular-cylindrical, 2 to 2½ in. long, about ½ in. in diameter, a little tapering towards the apex, more plainly angular at the apex, very blunt: all the angles obtuse. In damp forests at the banks of the river Delamboa, in company with *Kigelia pinnata* DC. (Welw. herb. no. 489), very rarely flowering; young fr. and a few fl. April 1856. The seeds were, unfortunately, not examined by Welwitsch; the fruits were hung up to dry and were eaten by monkeys; a fruit in the herbarium measures 4 in. long. No. **4215**. Seeds of the climbing shrub called "Mundondo," together with the placenta. In

primæval forests in Sobato de Mussengue, among the Queta mountains; fr. June 1856. No. **4213**. A slender shrub, lactescent, climbing high; root sweetly aromatic; leaves edible like spinach, pleasant, deciduous at least sometimes. In Mussengue and at Menha Lula; fr. Aug. and Sept. 1857. "Mundondo" (perhaps a variety of it). Coll. Carp. 158. No notes. In fl. No. **4216**. In forests by the Delamboa; fr. 1856. Coll. Carp. 7*c*.

This is probably the Asclepiadea mentioned in Welw. Apontam. p. 590, n. 89.

The following two Nos., each without either fl. or fr., perhaps belong to *Tylophora* :—

Golungo Alto.—A shrub; stem very tenacious, always green throughout its whole length, twining, used by the negroes for ropes, copiously juicy, not milky; petioles deeply channelled. In the dense forests of the Queta mountains, never seen to flower; cultivated at Loanda, April 1858, but not then in fl. The juice is suspected by the negroes, and not without reason, for although watery at first it quickly becomes gummy and very viscid, and on contact with the human skin it dries white and gives off a rather strong ammoniacal odour. No. **4278**.

Golungo Alto.—A widely climbing shrub. In the forests of Sobato de Mussengue; May 1856. No. **5997**.

20. **SPHÆROCODON** Benth. in Benth. & Hook. f. Gen. Pl. ii. p. 772.

1. **S. obtusifolium** Benth. in Hook. Ic. Pl. xii. p. 78. t. 1190 (1876)

Gongronema Welwitschii K. Schum. in Engl. Bot. Jahrb. xvii. p. 145 (9 May 1893).

Pungo Andongo.—In fl. Dec. 1896. No. **4196**. A herb with a woody rootstock, numerous sub-simple ascending almost twining stems, and atropurpureous flowers. In thickets at the river Luxillo near the bridge; fl. Feb. 1857. No. **4195**.

21. **MARSDENIA** Br.; Benth. & Hook. f. Gen. Pl. ii. p. 772.

1. **M. angolensis** N. E. Br. in Kew Bull. 1895, p. 258.

Pungo Andongo.—A herb, climbing extensively on *Vernonia senegalensis* Less., with yellowish flowers. In the Cambondo thickets in the præsidium, rather rare; fl. March 1857. No. **4245**.

Huilla.—A twining undershrub, woody at the base; stems terete, thickened at the nodes; the leaves peduncles pedicels and also the calyx softly pilose; corolla campanulate, rather fleshy, pale yellow-greenish, the limb quite patent at the time of the open flower. In secondary woods to the west of Lopollo, at an elevation of 5200 ft.; fl. Jan. 1860. No. **4250**.

The following No. should be compared with this species :—

Pungo Andongo.—An ascending, lactescent undershrub. In rather poor dense elevated thickets in Sobato de Quilombo Quiacatubia, rather rare; fr. middle of July 1856. No. **4254**.

2. **M. racemosa** K. Schum. in Engl. Bot. Jahrb. xvii. p. 147.

Gongronema latifolium Benth. in Hook. Niger Fl. p. 456 (1849).

Golungo Alto.—A shrub, climbing high and widely, with a soft pliant lactescent stem, glaucescent foliage, and yellowish-white flowers. In the forests of the higher Queta mountains, sporadic; scarcely in good fl. Oct. 1855. No. **4228**.

The following No. possibly belongs here, but the leaves are more cordiform nearly glabrescent and range up to 4 in. long by 3 in. broad; the follicles are nearly 3 in. long by $\frac{5}{8}$ in. broad.

Golungo Alto.—At the residency, Sange; in fr. No. **4229**.

The following No. has the habit of *M. crinita* Oliv. in Hook. Ic. Pl. xx. t. 1993 (Aug. 1891), a species from the Niger country; the leaves of our plant are rather larger and more deeply cordate at the base:—

Golungo Alto.—A softly shaggy, widely climbing herb, with herbaceous bright green long-ciliate leaves. In the elevated forests among the Queta mountains; without either fl. or fr. beginning of April 1856. No. **6201**.

22. **FOCKEA** Endl.; Benth. & Hook. f. Gen. Pl. ii. p. 773.

1. **F. multiflora** K. Schum. in Engl. Bot. Jahrb. xvii. p. 145 (9 May 1893).

F. Schinzii N.E. Br. in Kew Bull. 1895, p. 259 (Oct. 1895).

Bumbo.—A large shrub, with yellow-greenish flowers and lanceolate-subulate follicles 4 in. long or more. In Matas de Unteate (the forests composed of *Copaiba Mopane* O. Kuntze: Welw. herb. no. 605), between Bumbo and Bruco; fl. and fr. at the same time on the same individual shrubs but without leaves, Oct. 1859. No. **4194**.

The following should be compared with this species; the seeds are glabrous:—

Bumbo.—An arborescent shrub, climbing far and high, almost leafless: trunk 1 to 3½ ft. in diameter at the base; flowers greenish. In the Unteate forests between Bumbo and Bruco, but only in a few spots; ripe fr. ($5\frac{1}{2}$ in. long) and fl. Oct. 1859. "Veneno de Leão" (lion-poison). Coll. Carp. 6.

23. **DREGEA** E. Mey.; Benth. & Hook. f. Gen. Pl. ii. p. 775; non Eckl. & Zeyh.

1. **D. rubicunda** K. Schum. in Engl. Bot. Jahrb. xvii. p. 147 (9 May 1893), and in Engl. Pfl. Ost-Afr., C., p. 326, t. 39, fig. A—H. (2 Aug. 1895).

Libongo.—A slender, sarmentose, lactescent, high climbing, patently branched shrub; leaves membranous, bright green above, paler beneath, turning more or less yellowish in course of drying; flowers from greenish to whitish; calyx hoary-tomentose; corolla from greenish to yellowish outside, whitish inside. In the denser forests at the banks of the river Lifune near Banza de Libongo, at Arimo do Senhor Freire, not plentiful; fl. Sept. 1858. No. **4227**.

Cazengo.—A tall climbing, twining, lactescent undershrub, with greenish-yellowish rather fleshy leaves and flowers. In the dense forests of Muxâulo, rather rare; fl. Dec. 1854. No. **4226**.

Bumbo.—A shrub, climbing to a great height (up to 100 ft.) and at length widely spread over the surface of the crown of trees and there flowering. In Serra da Chella; fl. Oct. 1859. No. **4248**.

Huilla.—Near the Banza; in young fr. 5 April 1860. Perhaps this species. No. **4249**.

The following No. should be compared with this species, but it differs by larger foliage, etc. :—

Libongo.—A twining, widely climbing, lactescent shrub, with the habit somewhat of Mundondo (*Chlorocodon Whiteii* Hook. f.). In dense forests on the left bank of the river Lifune ; without either fl. or fr. end of Sept. 1858. No. **4233**.

24. **ORTHANTHERA** Wight, Contrib. Bot. Ind. (ii.) p. 48 (1833 ?); K. Schum. in Engl. Nat. Pflanzenfam. iv. 2. p. 265 (1895). *Barrowia* Decaisne (1844) ; Benth. & Hook. f. Gen. Pl. ii. p. 779.

1. **O. stricta** Hiern, sp. n.

A glaucous-pruinose, obsoletely tomentellous or glabrate, leafless shrub, 3 ft. high, of a very sad grey aspect, much branched from the base ; branches slender, terete, opposite or alternate, sub-decumbent or oblique, indicating by their position the direction of the prevailing winds ; flowers clustered several (5 to 7) together, lateral on the branchlets or at or opposite the base of the branchlets, about $\frac{1}{5}$ in. long in the bud, tomentellous outside, of a sordid-greenish colour ; calyx about $\frac{1}{10}$ to $\frac{1}{8}$ in. long, 5- or 6-cleft, the lobes triangular or lanceolate ; corolla-tube inflated at the base, somewhat constricted about or above the middle, $\frac{1}{8}$ to $\frac{1}{6}$ in. long ; the lobes of the limb 5 or very rarely 4, lanceolate, $\frac{1}{10}$ to $\frac{1}{8}$ in. long, valvate in æstivation ; follicles solitary or rarely so, 2 to $3\frac{1}{2}$ in. long, $\frac{3}{8}$ to $\frac{3}{5}$ in. broad, tapering at each end, glabrate, striate longitudinally ; body of the seeds about $\frac{1}{4}$ in. long.

Mossamedes.—In rocky maritime situations near Mossamedes, to the south of the town ; fl. and fr. end of June 1859. No. **4259**.

This should be compared with *O. albida* Schinz in Verh. Bot. Brandenb. xxx. p. 265 (Oct. 1888), but it appears distinct.

25. **CEROPEGIA** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 779.

1. **C. tentaculata** N. E. Br. in Kew Bull. 1895, p. 261.

Loanda.—A succulent herb, lactescent, twining, springing from a depressed-hemispherical bun-shaped fleshy-compact tuber of $1\frac{1}{2}$ to 5 in. in transverse diameter, whitish both inside and out ; the older tubers plunged deep in the ground, 6 inches in diameter, $1\frac{1}{2}$ to 2 in. deep, very juicy but insipid ; stem elongated, cylindrical, 2 to 10 ft. long, branched, below densely leafy ; the leaves gradually decreasing in size towards the apex of the flowering stem, opposite, cordate-ovate lanceolate- or oblong-linear or almost linear, very thickly fleshy, very rigid, brittle, herbaceous-green, more or less repand and undulate on the margin, rather obtuse or acuminate at the apex, shortly mucronate, mostly secund ; flowers subracemose-clustered on the abortive axillary branchlets ; calyx green ; corolla-tube somewhat curved, dilated and rosy-purple at the base, yellowish above ; the lobes of the limb green or yellowish-brown, ciliolate, spreading in a star, gradually attenuate into very long shiny capillary-filiform whitish more or less twisted extremities, not cohering at the apex ; staminal corona white-yellowish, 10-cleft ; the outer segments shell-shaped and concave, spreading ; the inner ones linear-spathulate, erect, connivent at the apex ; all thinly fleshy and green ; stigma flatly pentagonal, greenish ; follicles geminate, 4 in. long, slender, flesh-coloured, striate, cylindrical-

subulate, incurved at the apex. In hilly sandy bushy places near Loanda in winter, fl. from June to Aug. 1854 and 1858; in dry hilly places abounding in aloes, near Maianga do Povo, about 100 ft. from the ocean, very rare; without fl. Jan. 1858, fr. 1 March 1858; in similar situations near Alto das Cruzes, very rare, fl. and young fr. end of Feb. 1858. No. **4277**.

Var. **puberula**. Stem and leaves more or less puberulous.

Huilla.—Flowers sordidly violet-greenish. In sandy thickets near Lopollo, tolerably plentiful; fl. Dec. 1859. No. **4269**. A climbing, succulent herb, with a tuberous root and the habit of the genus. In rocky elevated thickets in Morro de Lopollo, rare; fl. March 1860. A unique specimen. No. **4268**.

2. **C. angusta** N.E. Br., *l.c.*

Pungo Andongo.—A suffruticose herb; root formed of tuberous-thickened fasciculate fibres; stem intricately twining, purplish; flowers variegated. By streams at Pedra de Cazella in the præsidium; fl. Jan. 1857. No. **4275**. A very slender undershrub, widely but not high climbing, twining, lactescent; root-tubers fasciculate; stem 4 to 8 ft. long or more. In elevated bushy rocky places by the streams of Pedra de Cazella; fl. April 1857. No. **4276**.

3. **C. leucotænia** K. Schum. in Engl. Bot. Jahrb. xvii. p. 151.

Golungo Alto.—A slender, rather limp, twining herb, pilose or pubescent almost throughout; juice watery, not milky; root tuberous, depressedly hemispherical; leaves softly membranous, green and without any sheen above, much paler beneath; calyx deeply 5-cleft; the segments narrowly linear, densely pilose, whitish-greenish; corolla tubular-funnel-shaped; the lobes of the limb free at the base and in the middle, ventricosely ascending, cohering at the apex, together forming a loopholed cavity; the ground-colour of the corolla pale sulphur outside, deeper sulphur inside, the tube inside at the base about the essential organs coloured with two purple rings and a little below the throat with another purplish ring and at the same time pervaded with very fine black longitudinal lines; the lobes of the limb fine, black-striate inside at the middle, quite black at the margin and apex or with a broad black margin; staminal corona apparently 10-cleft, with 5-erect, club-shaped, black-shining lobes; stigma nearly flat, pentagonal; follicles geminate, cylindrical-subulate, mammellate-dilated at the apex, obtuse, smooth. At the outskirts of elevated forests among the Queta mountains, near Carengue, very rare; fl. and young fr. beginning of May 1856. The young follicles in the study set are fusiform and the longer one is $3\frac{1}{2}$ in. long. No. **4270**. Root tuberous, the tuber hemispherical. Queta mountains; without fl. Apparently this species. No. **4223**.

Pungo Andongo.—In a marshy thicket near Quibanga, very rare; fl. Jan. 1857. Only one specimen. No. **4271**.

4. **C. volubilis** N. E. Br., *l.c.*

Golungo Alto.—A lactescent, twining, more or less glaucous herb, shaggy throughout, the pedicels with spreading hairs; root fibrous; corolla yellowish at very bottom, in the top part and on the tube outside marked with dusky spots, the ground-colour being whitish yellow, the apex of the lobes ashy outside, velvety-purple and beset with long purple rather rigid hairs inside, cohering at the very tip; corolla-tube pervaded with longitudinal atropurpureous lines inside;

the throat and lobes marked with dusky-purple reticulations inside except the apex of the lobes. By the lower thickets at the river Coango in the Queta mountains, near Sange, behind Senhor Rodrigo's house ; very rare ; fl. March 1856. No. **4272**. On bushy slopes on the right bank of the river Coango, behind Rodrigo's house ; without either fl. or fr. May 1856. No. **4272***b*.

5. **C. scandens** N. E. Br., *l.c.*, p. 262.

Golungo Alto.—A twining herb ; juice watery ; leaves rather fleshy and limp, deep green and without sheen above, paler beneath ; corolla pale sulphur in colour outside, punctate with blood-red specks : the lobes of the limb elongate-ovate, cohering at the apex, beset inside at the tip with rather long white hairs, marked at the medium with a large atropurpureous spot ; staminal corona 5-lobed ; the lobes ligulate, yellow, incurved at the apex ; anthers simple at the apex. In the lower sparse thickets by hills on the right bank of the river Coango, near Sange, rather rare and solitary ; fl. 2 Dec. 1855. No. **4273**. A suffruticose, sparingly lactescent herb, with long sarmentose branches ; root fibrillose, not tuberous ; flowers variegated with ashy and violet colours, lantern-shaped. On bushy slopes on the right bank of the river Coango, very rare ; fl. Jan. 1856. No. **4273***b*.

6. **C. pumila** N. E. Br. in Kew Bull. 1898, p. 693 (Nov.).

A herb, apparently climbing ; juice watery, not milky ; root tuberous ; the tuber sordidly whitish, depressedly hemispherical, somewhat rugulose, circular in horizontal figure, flattened or slightly convex at top and bottom, giving off from the latter descending fibres, 1 to 2 in. in diameter, fleshy, white inside ; stems several, 2 or 3 from one tuber, pale green, sparingly clothed here and there with short whitish hairs ; leaves opposite, lanceolate, setulose-ciliate on the margin with rather rigid spreading whitish cilia, glaucous-green or obscurely hoary-green above, pale glaucescent lepidote-rugulose, rather shining, and somewhat whitish beneath, rather fleshy, ranging up to 2 in. long by $\frac{5}{16}$ in. broad ; petiole short, semi-amplexicaul, canaliculate ; peduncles axillary $\frac{1}{2}$ in. long deflexed with subcorymbose short pedicels curved upwards at the middle, or extra-axillary short clustered 2 to 4 together one-flowered bracteate ; flowers lurid-dusky outside, velvety-atropurpureous inside ; calyx deeply 5-cleft, with ovate-lanceolate rather fleshy-tumid lobes, many times shorter than the corolla ; corolla tubular ; the tube scattered outside with whitish hairs, obscurely purple-velvety inside, ventricose at the base, constricted and curved upwards in the middle ; the mouth wide, 5-cleft, with narrow linear acuminate ciliate erect-spreading lobes ; staminal corona truncate-campanulate, the outer 5-lobed, the lobes very obtuse, the whole atropurpureous ; genitalia included, nestling in the basal ventricose part of the corolla, quasi-cyathiform, yellowish.

Huilla.—In a rocky bushy spot near Lopollo, at an elevation of about 5200 ft. ; fl. April 1860. No. **4267**.

The same plant was cultivated at Lisbon in the garden of Welwitsch's friend, Dom Lucena, in Sept. 1863, when another flowering stem was produced, 4 to 6 in. high, weakly erect, with corymbose flowers.

26. **CARALLUMA** R. Br.; Benth. & Hook, f. Gen. Pl. ii. p. 782.

Boucerosia Wight & Arn.; Benth. & Hook. f., *l.c.* *Quaqua* N.E. Br. in Gard. Chron. 1879. ii. p. 8, c. fig. 1, p. 9 (5 July 1879).

1. **C. huillensis** Hiern, sp. n.

A fleshy, broadly cæspitose, leafless herb, softly but obsoletely pubescent, with the habit of *Boucerosia umbellata* Wight & Arn. (Wight, Ic. t. 495); stem prostrate, rooting, branched from the base, branches sub-tetragonal, ascending, 2 to 3 in. long, thick, succulent, club-shaped, the angles on the upper part armed with broad thick teeth which terminate in cartilaginous rather blunt straight or slightly decurved tips; flowers clustered at and near the apex of branches, sub-umbellate, 6 to 10 together; peduncles rather thick, succulent, glabrous, longitudinally ribbed, $\frac{2}{5}$ to 1 in. long, bracteate at the base; bracts lanceolate-subulate, glabrous, about $\frac{1}{6}$ in. long; calyx 5-partite, with lanceolate-subulate glabrous segments rather more than $\frac{1}{4}$ inch long; corolla dusky red, slightly herbaceous, deeply 5-lobed, $1\frac{3}{4}$ to 2 in. long; the lobes lanceolate-linear, (in their dry state) $1\frac{1}{4}$ to $1\frac{1}{2}$ in. long, 3- to 5-nerved, thinly or obsoletely pubescent on the back, nearly glabrous and rugulose on the front, somewhat spreading; the tube about $\frac{1}{3}$ in. long, sub-hemispherical; staminal corona in two whorls, glabrous, the outer one having 5 pallid short very obtuse excise revolute lobes, the inner one of 5 longer dusky stout-subulate suberect ligules about $\frac{1}{5}$ in. long.

Huilla.—In fl. Dec. 1859. No. **4266**.

This is allied to *C. lutea* N. E. Br., a plant of extra-tropical South Africa, and crossing into the tropics in the Transvaal; it is, however, distinguished from the latter by the characters of the corona, the colour of the flower, etc.

27. **HOODIA** Sweet; Benth. & Hook. f. Gen. Pl. ii. p. 783.

1. **H. parviflora** N. E. Br. in Kew Bull. 1895, p. 265.

Mossamedes.—A fleshy, cactus-like shrub; stems numerous, cæspitose, mostly strictly erect, many-angled, whitish-chestnut or rosy in colour, 2 to 5 ft. high, flowering in an umbellate manner at the apex: angles spiny; spines chestnut-rosy; flowers chestnut-dusky in colour, scentless, campanulate-rotate; follicles semi-cylindrical-conical, flat on the face, approximated. In elevated rocks composed of mica-schist, about 1500 ft. alt., near Pomangala, and in dry places in front of Quitibe de Baixo, fl. Oct. 1859; also at Cavalheiros, fl. 23 Aug. 1859. No. **4265**. Stem like a *Cereus* in shape, 13- to 15-angled, cæspitose, 4 to 7 ft. high. In rocky places above Pomangala; fr. Oct. 1859. Eaten and considered delicious by the negroes. Coll. Carp. 35.

According to a ms. note of Welwitsch, this plant occurs also in Huilla.

28. **TAVARESIA** Welw. in Bol. Cons. Ultramar. Lisb. 1854, No. 7, p. 79, n. 4 (August 1854).

Decabelone Decaisne (1871); Benth. & Hook. f. Gen. Pl. ii. p. 784.

1. **T. angolensis** Welw., *l.c.*

Decabelone elegans Decaisne in Ann. Sc. Nat., ser. 5, xiii. p. 404,

t. 2 (1871); Bot. Mag. t. 6115 (1874). *Stapelia* (*Heurnia*) Welw. in Proceed. Linn. Soc. ii. p. 328 (7 Nov. 1854).

Loanda.—Stem low, creeping horizontally, widely cæspitose, 2 to 4 in. high; branches ascending or nearly erect, hexagonal; the angles sharp, tuberculate; the tubercles in dense rows, pyramidal at the base, tricuspidate; the 3 teeth or prickles horizontally spreading and callous; peduncles lateral, 1- to 2-flowered, corolla with a long tube and campanulate mouth; fruit cylindrical-subulate, 4 to 5½ in. long. In barren gravelly places above the city, very rare, fr. end of Oct. 1853; in poor pastures near Alto das Cruzes and Forte de Penedo, Dec. 1857; in gravelly maritime places near Loanda, fl. Dec. 1853 and Feb. 1854. No. **4262**. Follicles geminate. Loanda, May. Coll. Carp. 734.

29. **HUERNIA** R. Br.; Benth. & Hook. f. Gen. Pl. ii. p. 784. *Heurnia* Spreng. Anleit. ii. 1. p. 488 (1817); K. Schum. in Eng. Nat. Pflanzenfam. iv. 2, p. 280, fig. 84 F. (1895).

There appears to be no doubt that Brown was mistaken as to the spelling of the surname of the missionary, Justin Heurnius: see Hermann in Hort. Lugd.-Bat. Cat. p. 54 (1687) and L. Diss. Pl. Rar. Afr. p. 3 (Dec. 1760).

1. **H. similis** N. E. Br. in Kew Bull. 1895, p. 265. *Heurnia* sp., Welw. in Journ. Linn. Soc. iii. p. 154 (Feb. 1859).

Pungo Andongo.—A low, succulent, cæspitose, persistent herb; stems decumbent or ascending, sparingly branched, as well as the spreading branches herbaceous-green, tetragonal; the angles blunt, remotely denticulate; the teeth (leaves?) short, conical, from a broad base abruptly subulate, quite patent; branches and branchlets brittle, subglaucous, mostly sub-horizontally spreading, together with the stems obliquely inclined, cæspitosely interwoven; flowers small, scentless, usually solitary or 2 to 3 together from the same axil; peduncles very short, springing from the axils of the teeth on the stem; pedicels slender, 2 to 4, unequal in length, fleshy, reddish, ⅓ to ½ in. long, moderately thickened upwards towards the calyx; calyx very deeply 5-cleft, almost 5-sepalous, sordidly lurid-purplish; the segments from a broad base ovate-lanceolate, acuminate, keeled; corolla shortly campanulate, unequally 10-cleft, rather fleshy, lurid-purple outside, atropurpureous and papillose inside, whitish-rosy at the bottom around the included genitalia; the lobes of the sub-rotate limb alternately much shorter; the 5 larger lobes triangular-pointed; the 5 smaller ones very short, dentiform, obtuse; all quite patent at the time of the expanded flower; staminal corona double, the outer whorl consisting of 5 fleshy deep saffron-yellow lanceolate obtuse horn-shaped scales, the inner whorl of 5 sub-cucullate simple much shorter scales, all undivided; stigma green, somewhat pentagonal, flattened-muticous. On the mountain slopes of the præsidium, growing in clefts of the more elevated rocks, not uncommon, near Cabondo, Catete, etc.; fl. Oct. and Dec. 1856, Jan. to April 1857. No. **4264**.

30. **STAPELIA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 784.

The following No. is, perhaps, a new species of this genus, belonging to the section Tromotriche; it is in fruit but without flowers:—

Mossamedes.—A succulent, leafless, perennial herb, 4 to 6 in. high,

branched from the base: branches ascending, tetragonal, obtusely tapering towards the apex, obsoletely puberulous; the angles at least on the upper part muricate with obtuse short teeth; follicles spindle-shaped, finely striate longitudinally, obsoletely tomentellous, erect, $4\frac{1}{4}$ in. long, $\frac{1}{2}$ in. broad, supported on an erect peduncle about $\frac{1}{2}$ in. long which ascends from the middle of a branch; fruiting calyx 5-partite, the segments lanceolate, minutely puberulous, $\frac{1}{5}$ in. long. In dry hilly places by the Giraûl river; fr. Oct. 1859. No. **4263**.

LXXXIV. LOGANIACEÆ.

This Order, which contains the virulent poisonous drug, the Nux-Vomica, furnishes also well-tasting fruits resembling oranges, belonging to a section of the same genus, *Strychnos*, and called by the natives "Maboca." Under this name the fruits of several different species are known in Angola which are wholesome and very common, especially in the interior of Huilla, where at their proper season, in December and January, the natives can buy from two to four dozen for a cotton handkerchief or a sheet of white paper. The fruit forms a considerable part of the sustenance of the negroes, and it is also much appreciated by the European colonists for the sake of the acidulous-sweet and refreshing pulp which surrounds the seeds. There are two species of "Maboca" in the Huilla forests, the fruits of which, although tolerably alike outside and even in taste, differ greatly in the effect on the digestion; the one, which comes from trees with membranous and deciduous leaves, is pleasant and perfectly innocuous; while the other, which proceeds from a tree of 20 or occasionally 25 ft. high, with its trunk 1 to $1\frac{1}{2}$ ft. in diameter, and with evergreen stout and coriaceous leaves, provokes not uncommonly colic and diarrhœa. (See Welwitsch, Apontam. p. 549, n. 90, and Synopse Explic. p. 17, n. 42 and p. 34, n. 88; and Ficalho, Pl. Uteis, p. 224 [1884]).

1. **MOSTUEA** F. Didr.; Benth. & Hook. f. Gen. Pl. ii. p. 789; Baill. in Bull. Mens. Soc. Linn. Paris i. p. 244 (1880).

Coinochlamys T. And. ex Benth. & Hook. f., *l.c.*, p. 1091.

The capsules in this genus bear a resemblance to those of *Veronica*.

1. **M. fuchsiæfolia** Baker in Kew Bull., "April and May" (June) 1895, p. 96.

Pungo Andongo.—An erect, slender, much branched shrub, 3 to 5 ft high; branches long, divaricate; leaves obovate, puberulous; flowers pentamerous, rather fleshy, milk-white, glabrous as well as the slender peduncles; ovary bilocular, the cells bi-ovulate, the ovules collateral, erect; style bifid, the lobes again bifid: capsule compressedly obovate-reniform, bilocular, in shape and structure almost like *Bursaria*; the cells dispermous. In thickets at the outskirts of Mata de Cabondo, in the præsidium; fl. Feb., fr. May 1857. No. **4759**.

This species is very closely allied to *M. Brunonis* F. Didr. in Vidensk. Meddel. Nat. Hist. Kjöbenh., 1853, Nr. 3-4, p. 87 (1854), but differs by the presence of pubescence on the inflorescence and by larger flowers with a less deeply divided calyx; it is also closely allied to *Leptocladus Thomsoni* Oliv.

2. **M. angolana.**

Coinochlamys angolana S. Moore in Journ. Bot. xiv. p. 322, t. 182, f. 1 (1876), and xvi. p. 139 (1878).

Pungo Andongo.—An erect, very slender, virgately branched shrub, 3 to 4 ft. high, with membranous leaves, tubular, campanulate, milk-white flowers, and compressed didymous fruits. In dense shrubberies along the streams of the præsidium, near Catete; fl. Jan., fr. May 1857; also at Cabondo, sporadic; fl. Nov. 1856 and Feb. 1857. No. **4760**.

The following No. belongs possibly to a third species of *Mostuea*; the leaves however are not strictly opposite but sub-opposite, and the stipular scales are sufficiently different from those usual in this genus; in other respects the specimen suggests a *Dichapetalum*.

Golungo Alto.—A shrub, with the habit of a small tree, 5 to 8 ft. in height; the head spreading, widely frondose; ramification slender. In the secondary thickets of Alto Queta, above Querengue; without either fl. or fr. Jan. 1856. No. **4761**.

2. **NUXIA** Lam.; Benth. & Hook. f. Gen. Pl. ii. p. 792.

1. **N. dentata** R. Br. in Salt, Abyss., App., p. 63, name only (1814); Benth. & Alph. DC. in DC. Prodr. x. p. 435 (1846).

Lachnopylis oppositifolia Hochst. in Herb. Schimp. Abyss. iii., n. 1714 (*U. i.* 1844), and in Flora xxvi. p. 77 (7 Feb. 1843). *N. oppositifolia* Benth. & Alph. DC., *l.c.*

Mossamedes.—An arborescent shrub of 6 to 8 ft., or rarely a small tree of 10 ft. in the interior of the district where it ornaments the elevated rocks, much branched from the base, with the habit of a *Cordia*; the fresh branchlets, younger leaves and flowers viscid; inflorescence bracteate; flowers tetramerous, from whitish to yellowish; the calyx-lobes equal; corolla regular, sordid-violet in colour at the base: stamens 4, exserted, equal: style far exserted; stigma truncate. In sandy thickets along the banks of the rivers Bero and Maiombe, very plentiful; fl. July, Sept., and Oct. 1859 and June 1860. No. **5766**. A shrub, 6 ft. high, with the habit of *Euclea*; branchlets and inflorescence viscid; young leaves very viscid. In sandy places near Cavalheiros, sporadic; fl.-bud July 1859. No. **5767**.

2. **N. angolensis** Gilg in Notizbl. Bot. Berlin, No. 2, p. 74 (5 June 1895). *Premna* sp., Ficalho, Pl. Uteis, p. 240 (1884).

Golungo Alto.—A tree, 20 to 35 ft. high; trunk 1 to 1½ ft. in diameter; wood hard, whitish, sufficiently strong; branches divaricate; bark cleft, separating with the greatest ease; branchlets finely angular; leaves opposite or in most cases ternate, rather thick but neither fleshy nor coriaceous, glossy above, turning pale beneath; flowers corymbose, whitish, sweetly fragrant; calyx-tube 4- or rarely 3-toothed, very rarely only bifid and opening with two obtuse concave teeth; corolla tubular, white; the limb 4-cleft; the lobes valvate in æstivation, reflected in the open flower, the throat very shaggy; anthers whitish, reniform, exserted; style far exserted, white, a little curved; stigmas red, truncate. On the drier slopes of the mountains of Alto Queta and of Quilombo, not uncommon; fl.-bud 27 May 1855; at Undelle, fl. 10 June 1855. Native name "Mussalengue." Nos. **5670, 6689**. At Catomba by the river Luinha; fr. July 1856. No. **5660**. In fl.-bud. No. **5624**.

Pungo Andongo.—A tree, 15 to 25 ft. high ; branches spreading, tortuous ; leaves coriaceous ; flowers white. In wooded places at the river Tangue, sporadic ; fl. end of May 1857. No. **5678**.

Grows also among the high mountains of Dembos ; its wood has a very fine grain, white, and compact, and is well adapted for turnery : the tree however is not very plentiful, and occurs in stations difficult of access. (See Welwitsch, Synopse Explic. p. 8, n. 8.)

3. **BUDDLEJA** Houst. ex L. ; Benth. & Hook. f. Gen. Pl. ii. p. 793 (*Buddeia*).

1. **B. madagascariensis** Lam. Encycl. Méth. i. p. 513 (*Budleia*) (1783) ; Melliss, St. Helena, p. 298 (1875).

Island of St. Helena.—A slender, climbing shrub, with the habit almost of Verbenaceæ, but with the structure rather of Scrophulariaceæ ; branches and branchlets branny-felted, whitish-floccose ; flowers hermaphrodite, deep orange in colour ; calyx tubular-campanulate, quadridentate at the mouth ; corolla-tube straight, somewhat salver-shaped, exceeding the calyx, shaggy within ; the limb 4- or very rarely 5-cleft, with obovate-oblong lobes spreading horizontally ; stamens 4, inserted in the sinuses alternate to the corolla-lobes ; anthers scarcely protruded beyond the corolla-tube, erect, bilocular, dehiscing longitudinally ; ovary ovoid, free ; placentation central, multi-ovulate ; style solitary filiform, terminating in a thick oblong-spathulate rather viscid stigma, falling a little short of the anther-tips ; filaments very short or almost obsolete. Cultivated at Loanda in the garden of Senhor Gabriel ; fl. Sept. 1858. No. **4762**.

4. **ANTHOCLEISTA** Afzel. ; Benth. & Hook. f. Gen. Pl. ii. 795.

1. **A. macrantha** Gilg in Engl Bot. Jahrb. xvii. p. 578 (1893).

A. nobilis Welw. Apontam. p. 549, under n. 90 (1859) ; perhaps not of G. Don, Gen. Syst. iv. p. 68 (1837). *A. Vogelii* Ficalho, Pl. Uteis, p. 223 (1884) ; perhaps not of Planch. in Hook. Ic. Pl. t. 793-4 (1848).

Golungo Alto.—A tree, in habit resembling in its youth an elegant palm, repeatedly and dichotomously branched, attaining in the primitive forests a height of 50 ft., and bearing at the extremities of its branchlets tufts of gigantic leaves, from the centre of which proceeds the flowering corymb of 3 ft. or even longer ; flowers handsome ; corolla pale sulphur in colour, fleshy-coriaceous, brittle, thrown off in a few hours or usually within a quarter of an hour after its complete expansion from the investing calyx, quickly rotting after its fall ; the limb 13- to 15-cleft, the lobes contorted in æstivation, spreading in a rotate manner when fully expanded ; stamens equal in number to the corolla-lobes ; capsule as large as a small walnut. In the primitive forests of the Sobatos of Quilombo, Bumba, and Queta ; in the secondary woods the trees are lower, 20 to 25 ft. high, with broader foliage ; fl. and young fr. March 1856 ; fl. March and April 1856 ; a young tree, without fl. or fr. July 1856. Native name "Quipuculo-puculo." No. **6021** and Coll. Carp. 741. Sobato Quilombo, young foliage, Feb. 1855. No. **6021***b*.

Pungo Andongo.—In damp forests at the banks of the river Lombe : a tree-like shrub or young tree, without fl. or fr. March 1857. No. **6022**.

This tree, with its very peculiar habit, abounds in the woods of the mountainous region, and forms one of the chief features of the virgin forest.

The following No., perhaps, belongs to this genus :—

Cazengo.—A beautiful shrub of 5 to 7 ft. (perhaps a young tree), glaucescent throughout ; stem somewhat winged or two-edged ; sap viscid, not milky ; leaves coriaceous, much paler beneath ; petioles connate at the dilated base in a truncate cupuliform interpetiolar sheath. In the more elevated primæval forests of Serra de Muxaula ; only a few specimens seen, without either fl. or fr., June 1855. No. **4063**.

5. **STRYCHNOS** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 797.

1. **S. spinosa** Lam. Tabl. Encycl. ii. p. 38 (1793).

Brehmia spinosa Harv. ex DC. Prodr. ix. p. 18 (1845).

Loanda.—A small tree, 5 to 8 ft. high ; trunk 4 in. in diameter ; branches corky ; leaves submembranous ; flowers greenish ; fruit edible, like an orange in shape surface and bright colour, 2 to 3 in. in diameter. In bushy hilly places, chiefly in thin groves of *Adansonia*, between Alto das Cruzes and Quicuxe ; fl. from middle of April to middle of May. The young shoots, which after the October rains quickly spring up from the burnt root-stocks, have much smaller and rigidly coriaceous leaves. Negro name "Maboca." Nos. **4763, 6019**. Museque de Senhor Schut ; without either fl. or fr. March and April 1854. No. **4764**. An erect shrublet, 1 to 3 ft. high ; stems spiny, the spines decurved ; branches patent ; leaves coriaceous, rigid, shining. In sandy places, especially on the public roads, plentiful ; between Alto das Cruzes and Quicuxe ; without either fl. or fr. Nov. and Dec. 1853. Perhaps the young shoots of a full-sized shrub or of a tree. No. **4767**. In hilly bushy places near Loanda ; fr. May 1854 and June 1858. Coll. Carp. 115. A small tree, 6 to 8 ft. high ; trunk and branches from corky to several-winged : leaves deciduous ; fruit edible. In hilly mountainous thickets near Loanda ; fr. Coll. Carp. 747.

Golungo Alto.—A shrub, a foot high, shaped like a little tree ; branches patent ; spines axillary, hard ; leaves very bright green, rather fleshy-coriaceous. Along roads between Trombeta and Cambondo ; without fl. Sept. 1854. During four years never seen to flower. No. **4770**. A straight, subglaucous-green shrublet, 1½ ft. high ; leaves rather fleshy. By the Ambaca road between Sange and Camilungo ; without fl. Dec. 1854. No. **4771**. In secondary thickets by the king's highway near Cabondo ; without fl. June 1856. No. **4772**.

Ambaca.—A densely branched, very spiny shrublet of 1 to 2 ft., probably the fresh growth from the stock of a burnt or mutilated tree. In neglected highways between Izanga and N-gombe, plentiful ; without fl. Oct. 1856. No. **4773**.

Those specimens which are without flowers are referred here with some doubt.

2. **S. Volkensii** Gilg in Notizbl. Bot. Berlin, No. 2, p. 76 (5 June 1895).

Golungo Alto and Cazengo.—A tree, 8 to 12 ft. high ; trunk usually 2½ to 3 but occasionally 4 to 6 in. in diameter ; branches spiny ; leaves opposite, sub-coriaceous ; flowers greenish ; fruit like an orange in colour size and shape, edible ; pulp acidulous-sweet. In thickets and thin forests from Cambondo to the Luinha and Trombeta, tolerably plentiful ; also near Dalatanda in the Cazengo district ; fl. in the elevated parts of the Queta mountains, Nov. 1855. Native name "Maboca." No. **4768**. A tree of 10 to 15 ft. ; trunk 4 to 6 in. in diameter ; branches diffuse ; flowers greenish, very rapidly devoured by

insects. In the more open forests at the base of Alto Queta, sporadic ; fr. June 1855 ; fl. Dec. 1855. No **4769**. At Dalatanda, June 1855 ; said to be in fr. No. **4775**. A tree, 12 to 15 ft. high ; trunk 9 in. in diameter at the base, very rarely 12 in. ; fruit shaped like an orange ; pulp edible, acidulous-sweet. In the Luinha valley ; fr. 27 July 1856. Coll. Carp. 742. "Maboca doce," 1856. Fr. depressed-globose $2\frac{1}{4}$ to $3\frac{3}{4}$ in. in diameter. Coll. Carp. 743.

This must be compared with the last species, of which perhaps it may prove to be only a varying form ; the calyx-segments in our specimens are rather longer than in the type of Gilg's species. Those specimens which are without flowers are still more doubtfully referred.

3. **S. Welwitschii** Gilg in Engl. Bot. Jahrb. xvii. p. 573 (1893). *S. subscandens* Baker in Kew Bull. 1895, p. 96 (June). *S. loandensis* Baker, *S. microcarpa* Baker, *S. lucens* Baker, *l.c.*, p. 97.

Barra do Bengo and Loanda.—A shrub with fruit not poisonous like Nux-Vomica. Between Quicuxe and Cacuaco ; fr. March. No. **4765**. In young leaf and fl.-bud. No. **6016**. A climbing shrub. At Loanda ; fl. and unripe fr. Jan. 1858. No. **6017**. A subscandent, evergreen shrub ; unripe fruit ovoid-spherical or oblong, obliquely ventricose, green-glaucescent. In the more elevated hilly rocky somewhat woody places near Quicuxe ; young fr. May 1854. No. **6018**. A robust shrub, usually in the form of a small tree ; branches divaricate, sarmentose ; the sarmentose branchlets virgate, often climbing, densely warty, cirrhose ; the tendrils bifid, with the bifurcations hooked, thickened in the middle ; leaves coriaceous, glossy ; fruit spherical, resembling a small orange in shape and colour, $1\frac{1}{2}$ to 2 in. in diameter, harmless, edible. By thickets in dry hilly places in the Loanda country, as, for example, at Museque de Senhor Schut ; young fr. April ; ripe fr. July 1854. Native name "Maboca." No. **6015**. Fruit $1\frac{1}{2}$ in. in diameter. No. **4766**. A very elegant shrub ; branches subscandent ; leaves evergreen ; stipules becoming woody, recurved ; fruit precisely resembling an orange. Near Loanda ; seeds Jan. 1854. Coll. Carp. 745. A shrub, 5 to 6 ft. high, much branched, evergreen ; tendrils simple, circinate-hooked. In bushy places near Quicuxe and Mutollo ; young fr. May 1854. Coll. Carp. 746.

The specimens from the carpological collection, consisting only of seeds or young fruits, are doubtfully referred here.

The following No. perhaps belongs to this species, but the leaves are prolonged at the apex into a long narrow acumen :—

Golungo Alto.—A climbing shrub, not lactescent ; wood hard ; leaves coriaceous ; fruit reddish. Near Fundo de N-delle, in an Acacia forest ; fr. March 1855. No. **4774**.

The following No., of which the material is very scanty, has flowers with a long minutely puberulous style and small ovate leaves ; it should be compared with *S. Welwitschii* :—

Barra do Dande.—An apparently evergreen shrub with the habit of the order, the leaves falling off in the course of drying. In hilly bushy calcareous places near Barra do Dande ; only one specimen with a few fl. Nov. 1853. No. **1260**.

4. **S. angolensis** Gilg, *l.c.*, p. 571.

Pungo Andongo.—In fl. and fr. No. **6020**. An arborescent shrub ; trunk more or less curved or even twisted, 4 to 5 in. in

diameter at the base, leaves coriaceous, glossy ; flowers yellowish. In shady wooded places by rivulets in Barranco de Songue ; fr. Oct. 1856 ; fl. Feb. 1857. No. **4776**. A climbing evergreen shrub, with a few short simple hooked tendrils ; fruit baccate, of a pleasant orange colour, as big as a cherry, one-seeded, sparingly pulpy ; seed depressed-spherical. In shady places by the streams of the præsidium ; at the river Tangue, in nearly ripe fr. Dec. 1856. No. **4777**. A climbing shrub. At the river Tangue ; fr. Dec. 1856. Coll. Carp. 959.

The following No. should be compared with this species, and perhaps belongs to it :—

Pungo Andongo.—An evergreen shrub, with the habit of the genus. In thickets near Caghuy ; fl. apparently monstrous under the attack of insects ; Dec. 1856. No. **1230**.

5. **S. cocculoides** Baker in Kew Bull. 1895, p. 98.

Huilla.—A small or moderate-sized tree, 8 to 15 ft. high, with spiny-hooked branchlets. In mixed forests about Lopollo towards the Monino ; in marcescent fl. and young fr. Oct. 1860. A broad-leaved form of the Maboca doce. No. **4779**. A small tree with a Rhamnoid habit ; leaves and branches sometimes excessively sometimes but little shaggy or more or less pubescent. In mixed forests about Lopollo, plentiful ; fl. Oct. 1859 ; in very late fl. and ripe fr. Jan. 1860. Called "Maboca doce." No. **4780** and Coll. Carp. 744. A small tree, 12 to 15 ft. high, much and divaricately branched ; fruit edible. In damp forests near Lopollo, not uncommon ; in Humpata abundant ; fr. Dec. 1859 and Jan. 1860. Native name "Maboca," but it is different from the Maboca of Golungo Alto. The specimen consists only of seeds and therefore the determination is doubtful. Coll. Carp. 39.

6. **S. pungens** Solered. in Engl. & Prantl, Nat. Pflanzenfam. iv. 2. p. 40 (June 1892), and in Engl. p. 554.

S. occidentalis Solereder in Engl. & Prantl, *l.c.*

Huilla.—A tree, 15 to 20 ft. high ; trunk straight, 6 to 12 in. in diameter ; leaves rigid, glossy, mucronate, the mucro pungent ; fruit edible but acidly pungent, and when eaten in quantity deleterious and causing diarrhœa. In the Monino forests, in company with species of *Protea* ; ripe fr. Jan. 1860. No. **4778**. Flowers whitish ; in the same locality ; Nov. 1859. No **4778***b*. A small tree, 10 to 20 ft. high, branched a little above the base ; branches rather erect ; leaves rigidly coriaceous, pungent-mucronate ; fruit in form and colour like an orange ; pulp acidulous, orange in colour, investing the seeds. In wooded places near Lopollo ; fr. Dec. 1859 and Jan. 1860. Seeds only, apparently belonging to this species. "Maboca venenosa." Coll. Carp. 40.

The following two Nos. have the general aspect of this order, and the foliage is rather suggestive of the genus *Usteria*, but the absence of both flowers and fruit renders this position quite doubtful :—

Golungo Alto.—A very elegant, small tree, 6 to 8 ft. high ; branches erect-spreading, firm ; leaves thickly and succulently coriaceous, very glossy. In forests and thickets at the river Cuango, but never seen to flower ; May 1855. No. **6686**. Apparently the same plant. No. **3253**.

LXXXV. GENTIANEÆ.

1. **SEBÆA** Soland. ex R. Br.; Benth. & Hook. f. Gen. Pl. ii. p. 804.

1. **S. brachyphylla** Griseb. Gent. p. 170 (1839); Engl. Hochgebirgsflora, p. 335 (1892); Gilg in Engl. Bot. Jahrb. xxvi. 100 (1898).

Huilla.—In moist pastures throughout the district, very plentiful, from Oct. to March; near Lopollo at an elevation of 4500 to 5500 ft.; fl. and fr. Nov. and Dec. 1859 and Feb. 1860. No. **1520**. Cf. Coll. Carp. 750. An annual herb, with the habit of a *Centaurium* and with small yellow flowers. Lopollo in damp places; seeds Feb. 1860. Probably this species. Coll. Carp. 749.

From a note attached to *S. affinis*, with which species Welwitsch had at one time associated this plant, it appears that the latter is a powerfully bitter herb and was usually employed with very good effect by the colonists in Huilla as a tonic, in lieu of *Centaurium umbellatum* Gilib. which is not indigenous in Huilla. A decoction prepared from this plant, together with *Faroa salutaris*, is a potent restorative after fever; its virtues were tested by Welwitsch. This is probably the plant referred to by Welwitsch, Synopse Explic. p. 55, n. 145, under the Portuguese name of "Fel da terra de flor amarella."

2. **S. Welwitschii** Schinz in Vierteljahrsschrift Nat. Gessellsch. in Zürich, xxxvi. p. 321 (1891); and in Bull. Herb. Boiss. iv. p. 443 (June 1896); Gilg, *l.c.*, p. 92.

S. khasiana C. B. Cl. in Hook. f. Fl. Brit. Ind. iv. p. 99 (1883) partly, not in Journ. Linn. Soc. xiv. p. 428 (1875).

Huilla.—A parasitical, filiform, erect, 2- to 6-flowered herb; habit of *Centaurium*; stem simple or sparingly branched, quadrangular: leaves ovate-acuminate, connate at the base, rather rigid, distant, opposite; flowers yellow; calyx deeply lobed; the segments ovate-lanceolate; corolla-lobes lanceolate; stamens inserted between the corolla-lobes, exserted; filaments in some flowers nearly straight, not at all curved below the anthers; anthers variable in shape, sometimes long-spathulate or oblong-claviculate and longer than the style, in other cases shortly spathulate, almost shorter than the style and hollowed out with one side as it were arched. Parasitical among grasses and on clumps of Cyperaceæ along the banks of the Monino river in spongy or swampy places; fl. and fr. Jan. 1860. No. **1521**. An annual, erect, lovely, little herb, scarcely 8 in. high; habit almost of *Curtia tenella* Cham.; stems filiform, mostly shortly bent at the base, promptly straightening, simple or with one branch above the middle or trichotomous; branches ascending 1- to 3-flowered; leaves minute, $\frac{1}{12}$ to $\frac{1}{3}$ in. long, sub-connate at the base, ovate-lanceolate, keeled, subulate at the apex, squamiform so that the stem seems partly leafless, adpressed to the stem; internodes about 1 ($\frac{3}{4}$ to $1\frac{1}{2}$) in. long; cymes 1- to 16-flowered; flowers ebracteolate, yellow, mostly pentamerous, 4- to 6-merous; 5- and 6-merous flowers seen on the same specimen; corolla salver-shaped: the tube swelled at the base, constricted below the limb; the lobes ovate rather obtuse; stamens exserted; anthers sub-sagittate at the base without glands at the apex or with very small glands, but present only on one or two of them, at length spirally twisted; style straight, filiform, exceeding the stamens; stigma globose-cæspitate, pileiform, widely hollowed at the base and there obtusely bilobed; capsule 2-celled; placentation free, 4-lobed; seeds oblong-subquadrate, various in shape, when not

quite ripe foveolate. Parasitic on the rhizomes of low Cyperaceæ, in damp shortly grassy pastures along the Humpata river (Quipumpunhime), plentiful; fl. and fr. 24 April 1860. No. **1522.**

3. **S. affinis** Welw. ms. in Herb.

An annual, slender, erect, glabrous, sub-glaucescent herb, 8 to 12 in. high, branched from the base; radical leaves rosulate, broadly elliptical, obtuse; stem quadrangular, with the angles sub-acute and membranous-winged, several times dichotomously divided, gradually finishing in a corymbose flowering panicle; stem-leaves ovate or lanceolate, acute or acuminate at the apex, somewhat narrowed at the base, sessile, the uppermost ones the smallest; flowers $\frac{1}{4}$ to $\frac{3}{5}$ in. long, on short unequal pedicels or subsessile; calyx pentagonal, $\frac{1}{6}$ to $\frac{1}{4}$ in. long, 5-partite; the segments acutely keeled, obtusely acuminate at the apex, with broad white membranous margins; corolla salver-shaped, yellow, the tube somewhat inflated, narrowed below the 5-cleft limb; the lobes ovate-acuminate, spreading at the time of the flower, in old age spirally twisted above the ovary; stamens 5, exserted; filaments very short, equal, inserted in the sinuses between the corolla-lobes; anthers attached at the middle of the back, longitudinally dehiscing, obtusely sagittate at the base, subspiral at the apex in old age, surmounted at the apex with a small sub-orbicular rather thick waxy-yellow gland, scarcely curved at the apex; ovary elliptical, bi-ovulate; the margins introflected; ovules very numerous, horizontal; style terminal, short, straight; stigma longer than the style, simple, rather thick, subprismatic-clavate, level with the anthers, obtuse, thinly papillose-pubescent; unripe capsule ellipsoidal-inflated, bilocular; placentation at length free; seeds minute, very numerous.

Mossamedes.—In a moist sandy spot, usually flooded, among low bushes at the left bank of the river Bero (Rio das Mortes) near Cavalheiros; only one specimen seen; fl. and fr. 21 Sept. 1859. No. **1519.**

This differs from *S. brachyphylla* by the stem-leaves being ovate-acuminate and not obtuse, by the much laxer inflorescence, by the alate calyx, by the corolla-lobes being gradually more acuminate, and by the larger glands on the anthers.

2. **PARASIA** Rafin. Fl. Tellur. iii. p. 78 (1836).

Belmontia E. Mey. (1837); Benth. & Hook. f. Gen. Pl. ii. p. 804.

1. **P. platyptera.**

Belmontia platyptera Baker in Kew Bull. 1894, p. 25.

Pungo Andongo.—An annual, erect, little herb; stem winged-quadrangular, as well as the rather fleshy leaves herbaceous-green; branches opposite; flowers yellow, rather small, with a circle of small glands between the bottom of the calyx and the funnel-shaped corolla; corolla-lobes ovate, rather obtuse; stamens included; ovary very shortly stipitate, beset around the base with very small crowded glands sessile at the bottom of the calyx, that is, at the base of the corolla; style sparingly pubescent, reaching the middle of the anthers; stigma somewhat bifid, papillose; placentation central, 4-parted, quite

free in the ripe capsule; edges of the carpels inflected and somewhat cohering with the septum; seeds quadrangular-prismatic, very delicately papillose. In sandy moist places among low herbs, between Lombe and Quibinda, in company with *Fimbristylis exilis* R. & S., sparingly; fl. and fr. middle of March 1857. No. **1512**. In similar places at the river Cuanza, near Muta Lucala; fl. and young fr. March 1857. No. **1512***b*.

By some mistake this plant bears the Welwitsch no. 1524 in Herb. Kew, and is so quoted by Baker, *l.c.*

2. **P. grandis.**

Belmontia grandis E. Mey. Comm. Pl. Afr. Austr. p. 183 (1837). *Exochænium grande* Griseb. in DC. Prodr. ix. p. 55 (1845); Welw. in Trans. Linn. Soc. xxvii. p. 49 (1869).

HUILLA.—An annual herb, 3 to 11, usually 3 to 5 in. high; rhizome parasitical, after the manner of *Striga*, adhering to the roots of neighbouring plants by means of its short whitish fleshy very brittle fasciculate fibres, chiefly affecting bulbous or tuberous Cyperaceæ; stem erect, acutely tetragonal, bright green, filled with a very loose pith, rather sparingly branched towards the apex; leaves lanceolate-elliptical, semi-amplexicaul, herbaceous-green, obtusely keeled; flowers horizontally nodding, almost like *Mimulus*; calyx 5-cleft, the lobes binged-keeled; corolla hypogynous, somewhat salver-shaped, very wright sulphur in colour, sub-bilabiate, marcescent; the tube but little exceeding the calyx; the lobes of the limb 5, ovate, very patent; stamens 5, inserted on the lower part of the corolla-tube, included, equal; filaments flattened at the insertion of the anthers, incurved-thickened, longer than the anther-cells; anthers oblong-linear, 2-celled, dehiscing longitudinally, with one gland at the apex and two glands at the base, at first exceeding the stigma, at length adhering to the enlarged stigma, forming a ring round the neck of the stigma and quasi-epigynous by the rupture of the filaments; the apical gland stalked, ellipsoidal-spathulate, central; the basal glands smaller, suborbicular, shortly stalked, lateral; ovary obovoid-elliptical, 2-celled, the edges of the valves introflected, the cells many-ovuled; style central, falling short of the anther-tips or longer, firm, shorter than the thickly club-shaped, rather compressed pubescent stigma which is broadly winged on both sides; capsule ovoid, turgid, 2-celled; placenta at length 4-parted, tolerably large, spongy, at length free from the capsule; seeds very numerous, minute, cinnamon-brown or tawny, subglobose, angular, minutely scrobiculate or foveolate. Parasitical in spongy and marshy densely herbaceous places on clumps of Cyperaceæ, in company with species of *Drosera*, *Lobelia*, *Striga*, *Scleria*, *Xyris*, *Eriocaulon*, etc., near Lopollo; in the Monino meadows by the stream; fl. and fr. Dec. 1859 and Jan. 1860. No. **1516**. In elevated spongy places, on the roots of various Rubiaceæ, in the Monino pastures; fl. and fr. Feb. 1860. A broad-leaved form. No. **1516***b*.

3. **P. primuliflora.**

Exochænium primulæflorum Welw., *l.c.*, p. 47. *Belmontia primulæflora* Schinz in Vierteljahrsschrift Nat. Gesellsch. Zürich, xxxvi. p. 332 (1891).

HUILLA.—An annual, little herb, 2 to 3 in. high, branched from the base; branches and branchlets subcorymbose; radical leaves elliptical; stem-leaves linear-lanceolate; calyx but little winged, keeled-angular; corolla deep-yellow; the lobes of the limb 5 or rarely 4, broadly

ovate, narrowed at the base, abruptly acuminate at the apex ; anthers surmounted at the apex with lanceolate-linear glands as long as the cells or rather longer, biglandular at the base ; filaments in some cases elongated, in others oftener very short ; style filiform, pubescent with short glandular hairs, rather short ; stigma cylindrical-clavate, densely papillose-bearded, entire or scarcely emarginate at the apex ; placentation central ; edges of the carpels quite coalescent. In elevated spongy pastures with short herbage, in Morro de Lopollo, towards Humpata, above 5300 ft. alt., in company with species of *Utricularia*, etc., plentiful ; fl. and fr. March and April 1860. No. **1513**. Flowers whitish-yellowish. In swampy meadows at the river Monino, in company with various species of *Drosera* (cf. *D. Burkeana* : Welw. Herb. No. 1184) and *Xyris* ; fl. and fr. end of April 1860. No. **1513***b*.

Var. *β.* **nana.**

E. primuliflorum, *β. nanum* Welw., *l.c.*, p. 48.

Huilla.—A pleasantly green, dwarf herb ; flowers brilliant, golden-yellow. On the swampy slopes of the loftiest mountains, nearly dried up at the time, to the south of Huilla, and on the left-hand side of the road leading from Lopollo towards Gambos ; fl. end of April 1860. No. **1514**. Apparently annual ; flowers golden-coloured. In moist pastures in short grass, plentiful ; fl. and fr. Feb. and April 1860. Coll. Carp. 748.

4. **P. debilis.**

Exochænium debile Welw., *l.c.*, p. 48. *Belmontia debilis* Schinz, *l.c.*, p. 332.

Pungo Andongo.—A flaccid, parasitical little herb, 1 to 2 in. high, apparently not annual ; rhizome rather thick, whitish, somewhat fleshy, brittle, creeping obliquely among marsh herbs; stems numerous, rather fleshy, very brittle, subtetragonal ; flowers milk-white, pentamerous, cymosely fastigiate ; calyx deeply cleft ; corolla thin-fleshy ; the lobes obovate-oblong or obovate, not mucronate, obtuse ; the limb campanulate-spreading ; stamens inserted at the middle of the corolla-tube or a little higher, included ; anthers introrse, 2-celled, biglandular at the base ; the connective fleshy, tumid, produced far beyond the cells ; ovary 2-celled ; style straight ; stigma elongated-clavate, velvety ; capsule globose, many-seeded. In grassy muddy places nearly dried up at the time, at the Lagôa de Quibinda on the right bank of the river Cuije, sparingly : fl. and fr. March 1857. No. **1511**.

5. **P. gracilis.**

Belmontia gracilis Welw., *l.c.*, p. 47.

Huilla.—An annual, little herb, 2½ to 6 in. high, with the habit of a maritime *Centaurium* but more slender ; stem filiform, nearly naked, tetragonal, erect, very sparingly branched ; leaves opposite, linear-lanceolate, channelled, erect-spreading, semi-amplexicaul at the base, somewhat decurrent ; internodes long ; flowers yellow, pentamerous, rather large, 1 to 3, erect, rather lax ; calyx deeply cleft; the segments long-acuminate, winged-keeled, broad at the base, with white membranous margins and groups of very minute glands at its base between it and the funnel-shaped corolla ; corolla-tube inflated at the base, constricted in the middle below the limb ; the lobes ovate, apiculate, spreading at the time of flowering, the whole corolla marcescent and at length adhering to the ovary ; stamens inserted on the corolla-tube below the limb, included ; filaments equal at the base, about twice the

length of the anthers ; anthers erect, dehiscing longitudinally, apiculate at the apex, eglandular at the base ; ovary oval, bisulcate, 2-celled ; the edges of the carpel-valves introflected and nearly reaching the placenta ; style straight, firm, short ; stigma relatively large, scarcely or but little shorter than the style, thickly clavate, scarcely if at all bilobed at the apex, reaching the top or middle of the anthers ; seeds quadrangular-prismatic. Subparasitic, in spongy meadows, in the wooded parts of the northern region of the Monino, in company with species of *Utricularia*, *Burmannia bicolor*, *Xyris*, etc. ; fl. and fr. beginning of April 1860. No. **1524**.

3. **CHIRONIA** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 805.

1. **C. angolensis** Gilg in Engl. Bot. Jahrb. xxvi. p. 104 (1898).

Huilla.—An erect, quite glabrous, suffrutescent herb, 2 to 4½ ft. high, with the habit of some species of *Exacum*, really handsome, by far the most robust of all tropical African Gentianeæ, and at the same time remarkable for the size and bright rosy violet colour of its numerous flowers ; root perennial, rather thick, sub-fusiform, woody, nearly an inch thick at the neck ; stems 2 to 5, quadrangular, acutely winged at the angles, simple below to the height of 1 to 1½ ft., branched above, green, not glaucous ; branches opposite, erect-patent, somewhat 4-winged, the lower ones ranging up to 6 in. long ; branchlets fastigiate ; leaves much acuminate ; the lower stem-leaves lanceolate, 2 to 3 in. long, but little more than ½ in. broad in the middle, at the base decurrent on both sides into a narrow wing, 3-nerved, bright green, longer than or as long as the internodes of 1½ to 3 in., patent on the flowering plant ; the upper leaves linear-lanceolate or linear, gradually narrower and shorter, the uppermost and floral ones narrowly linear, almost subulate ; panicles ample, about a foot long, 20- to 60-flowered ; pedicels 1 to 1½ in. long, unequal, erect-spreading, quadrangular, somewhat thickened towards the apex ; flowers erect, 1 to 1½ in. long ; calyx glaucescent-green ; the segments 5, obtusely but clearly keeled, membranous on the margins, linear-lanceolate, subulate-acuminate at the apex with the prolonged keel far exceeding the corolla-tube, rather strict ; corolla rather fleshy, becoming chartaceous-rigid in the course of drying, deeply 5-lobed ; the lobes broadly lanceolate, gradually acuminate at the apex, at least twice as long as the calyx, tardily deciduous ; stamens 5 ; filaments short, dilated-flattened at the base, inserted a little below the sinuses of the corolla, declinate, anthers oblong, 2 or 3 times as long as the filaments, cordate at the base, 2-celled ; the cells longitudinally dehiscent, spirally twisted ; style divergent from and longer than the stamens, at the apex thickened, 2-lobed ; the lobes erect, stigmatose ; ovary rather fleshy. On woody grassy rocky slopes of the loftiest ridges of the mountains of Serra de Xella, not far from and below Mumpulla, at an elevation of 4000 ft., in rather dry situations ; fl. June and July 1860. No. **1526**.

2. **C. erythræodes** Hiern, sp. n.

An annual, glaucescent-green, rather fleshy, erect herb, with the aspect of a *Centaurium*, nearly glabrous, about a foot high ; root rather thick at the crown, decumbent, giving off descending fibres at its base and several erect or ascending stems at its apex ; stems compressed-quadrangular, leafy at the base, simple below, branched at the inflorescence, the angles narrowly winged ; radical leaves rosulate, obovate-spathulate, ¾ to 1½ in. long by ¼ to ½ in.

broad, rounded at the apex, inconspicuously 3-nerved and narrowed at the sessile base; stem-leaves variable in shape and size, more or less oblong or lanceolate and shorter than the internodes, an inch long or less, semi-amplexicaul, suberect, rather fleshy and rigid, decurrent at the base on both sides down to the next node, rather obtuse or abruptly acuminate at the apex, the acumen cartilaginous, small; flowers $\frac{1}{2}$ to $\frac{5}{8}$ in. long just before expansion, on equal rather slender pedicels, arranged in rather lax terminal ovoid panicles; calyx deeply 5-lobed, openly campanulate; the segments lanceolate, acuminate, $\frac{1}{4}$ in. long, quincuncial, somewhat keeled, minutely glandular-puberulous on the back, green with broad scarious margins; corolla about $\frac{3}{5}$ in. long, deeply 5-lobed, of a deep rosy colour; the tube very short, campanulate; the lobes oval, rounded, about $\frac{1}{2}$ in. long, quincuncial, spreading, veiny; stamens 5, glabrous, declinate, exserted; filaments lanceolate-linear, compressed, $\frac{1}{10}$ in. long, inserted a little below the corolla-sinuses; anthers yellow, $\frac{3}{16}$ in. long, oblong, spirally twisted or somewhat so even in the bud, 2-celled; cordate and attached to the filament at the base, eglandular; the cells very broad; style glabrous, longer than and diverging from the stamens; stigma thickened, rather curved; ovary compressed, oval, $\frac{1}{5}$ in. long, $\frac{1}{10}$ in. broad, 2-celled.

Huilla.—By nearly dried up swamps near Lopollo, at an elevation of 5000 ft., rare; fl. 23 Dec. 1859. No. **1525.**

4. **FAROA** Welw.; Benth. & Hook. f. Gen. Pl. ii. p. 806.

1. **F. salutaris** Welw. in Trans. Linn. Soc. xxvii. p. 46, t. 17 (1869); Ficalho, Pl. Uteis, p. 225 (1884).

Huilla.—A very elegant herb, annual or biennial, 2 to 5 in. high, decussately branched from the base; root and stems, etc., abounding in a very better principle and furnishing by far the best tonic medicine used by the negroes for dysentery and with still better effects in intermittent fevers; radical leaves rosulate, narrowly lanceolate-linear, 1 to $2\frac{1}{2}$ in. long; stem-leaves similar or also linear, sessile, semi-amplexicaul, rather erect, deep green, rather fleshy, opposite or the uppermost ones at the base of the heads of flowers quaternate and resembling a tetraphylleus involucre; flowers at the apex of the stem and branches umbellate-capitate, clear-blue violet-coloured or milk-white; calyx quadrangular, 4-cleft; the lobes erect, broadly membranous at the base, gradually narrowed and obtuse at the apex, obtusely keeled on the back, equalling the corolla-tube, mostly obscurely purple; corolla funnel-shaped, hypogynous; the tube gradually widened upwards; the limb-lobes 4, erect-spreading in flower, marcescent; stamens 4, inserted on the corolla-tube between the lobes, exserted; filaments flattened-filiform, equal, each furnished below the base with a semi-lunar gland on the corolla-tube; anthers obscurely flesh-coloured or purple, eglandular, longitudinally dehiscing, not twisted, introrse; style straight, filiform, purple, gradually terminating in the very narrowly truncate and delicately papillose sub-bilobed or simple stigma. In damp sandy pastures throughout the plateau of Huilla, between Nene and Humpata, from 4200 to 5500 ft. alt., very plentiful, in company with *Trifolium polystachyum*, var. *psoraleoides* (Welw. herb. no. 1902), *T. subrotundum*, var. *obcordatum*

(Welw. herb. no. 1901), and an *Indigofera* ; fl. Oct. 1859 to Jan. 1860 ; fr. Feb. and March 1860. No. **1523** and Coll. Carp. 74.

This (and perhaps also the two species of *Chironia*) is probably the plant referred to by Welwitsch, Synopse Explic. p. 55, n. 144, under the Portuguese name of "Fel da terra de flor roxa."

5. **HIPPION** Spreng. Syst. Veg. i. p. 589 (1825), *majore parte* ; F. W. Schmidt in Röm. Archiv. Bot. i. p. 9 (1796), *minimâ parte*.

Enicostema Blume, Bijdr. Fl. Ind. Bat. p. 848 (1826) ; Benth. & Hook. f. Gen. Pl. ii. p. 807.

1. **H. verticillatum** F. W. Schmidt in Röm., *l.c.*, i. p. 11 ; Spreng., *l.c.* ; O. Kuntze Rev. Gen. Pl. p. 428 (1891) (*Hippionum v.*).

Gentiana verticillata L. Syst. Nat., edit. 10, ii. p. 952 (1759). *Ericoila verticillata* Borckh. in Röm., *l.c.*, i. p. 27. *Enicostema littorale* Blume, *l.c.*, *Enicostemma verticillatum* Engl. ex Gilg in Engl. Nat. Pflanzenfam. iv. 2, p. 67 (Feb. 1895).

Benguella.—A herb or undershrub, ½ to 1½ ft. high ; rhizome more or less creeping, descending very deeply, perennial, yellow-whitish ; stem erect, glaucous-green, rather fleshy throughout, simple or sparingly branched ; leaves linear-lanceolate, elongated, 3-nerved, amplexicaul, opposite, decussate ; flowers white, turning yellow in drying, subsessile, clustered in the axils, 1- or 2-bracteolate, the bracteoles linear-lanceolate, nearly as long as the calyx-lobes, erect-spreading ; calyx 5- (or occasionally 2- or 3-) lobed ; the lobes erect, membranous on the margins ; corolla tubular, 5-cleft, rather fleshy, persistent, funnel-shaped ; the lobes erect-spreading, contorted in æstivation, ovate, rather blunt, somewhat arched and involute at the apex, rather rigid ; stamens 5, sub-exserted, inserted below the middle of the corolla-tube ; filaments dilated in an arched manner at the base, without intervening teeth, the margin of the arch wavy ; anthers oblong, hastate, shortly bilobed at the base, attached at the sinus, erect, 2-celled ; the connective produced at the apex into a thin apiculus ; ovary obovoid, unilocular ; ovules very numerous, inserted at the sutures ; style cylindrical, firm, straight, reaching the middle of the anthers ; stigma thick, capitate, closely surrounded by the anthers ; capsule ovoid or obovoid-oblong, covered with the marcescent corolla, unilocular ; placentas sutural ; seeds numerous, comparatively not very small, chestnut-rufous, inserted on the placentas by means of flattened funicles. In sandy-muddy, sparingly herbaceous places, flooded in winter, by the ocean to the south of the city of Benguella, in company with *Mollugo hirta* Thunb. and *Cressa cretica* L. (Welw. herb. no. 6138), not uncommon ; fl. and fr. end of June 1859. No. **1517**.

Mossamedes.—A suffrutescent herb, with yellow root and white flowers. In brackish beds of rushes near the mouth of the river Bero, near Mossamedes, plentiful ; fl. and fr. July 1859. No. **1518**.

6. **SWERTIA** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 816.

Sweertia Koch, Syn. Fl. Germ., edit. 2, p. 558 (1844).

1. **S. stellarioides** Ficalho, Pl. Uteis, p. 225 (1884).

Adenopogon stellarioides Welw. Synopse Explic. p. 27, n. 59 (1862). *S. Welwitschii* Engl. Hochgebirgsflora, p. 339 (1892) ; Gilg in Engl. Bot. Jahrb. xxvi. p. 110 (1898).

Huilla.—A slender, erect, very bitter, annual herb, with the habit of *Ophelia* ; stem usually branched, subangular, somewhat swelled at the nodes, about a foot high ; leaves opposite, lanceolate-linear, semi-amplexicaul, 1-nerved, obtusely keeled beneath, erect, bright green as well as the stem and branches, the upper ones gradually narrower ; flowers corymbose-paniculate, numerous, strongly resembling those of a *Stellaria* ; calyx 5-partite ; the segments lanceolate, narrow, flat, 1-nerved, cuspidate ; corolla rotate, deeply 5-lobed ; the lobes ovate-oblong, milk-white outside, streaked with purple lines inside, twice as long as the calyx, glandular a little above the base with greenish geminate depressions which have long cilia at their edges ; stamens 5, inserted on the very short tube of the corolla ; filaments a little widened and almost cohering in a ring at the base ; anthers in the living state purple, turning green in drying, typically introrse, after the flowering extrorse, not twisted ; ovary unilocular, cylindrical, sub-compressed ; stigma sessile, broadly bilabiate, terminal, large ; the lips diverging at the time of the flower, at length somewhat reflected at the margin ; ovules at both sides of the sutures, very numerous, horizontal ; placentas sutural, geminate, distinct, spongy-fleshy ; capsule unilocular, compressed-cylindrical, bivalved, obtuse ; seeds numerous, comparatively large for the order, globose, densely tuberculate ; the tubercles minute, hemispherical, smooth, rather shining. In somewhat sandy damp wooded pastures in Morro de Lopollo, between 5200 and 5600 ft. alt., very plentiful ; fl. and fr. beginning of April and 4 May 1860. No. **1515**. At Humpata ; fl. and fr. May 1860. Coll. Carp. 51.

All the parts of this plant are very bitter ; the natives, however, do not make any use of it, nor do they give a special name to it ; but Welwitsch considered it quite equal or even superior in its medicinal qualities to the *Fel da terra* of Portugal, that is, *Centaurium majus* (*Erythræa major* Hoffm. & Link), and capable of affording a substitute for *Gentiana lutea* L.

LXXXVI. BORAGINEÆ.

1. **CORDIA** Plum., L. ; Benth. & Hook. f. Gen. Pl. ii. p. 838.

The wood which the negroes of Africa, in the most diverse districts and various tribes, make use of for procuring fire by means of rubbing sticks together, belongs to the genus *Cordia*. Thus, in Golungo Alto and around Ambriz, in Songo and in the interior of Loanda, on the river Cuanzo and likewise in Benguella, when desirous of making a fire, the negroes nearly everywhere pointed out to Welwitsch trees of this genus as those best adapted for the purpose.

1. **C. rubra** Hochst. in Pl. Schimp. Abyss. iii. n. 1582 (*Ut.*, 1844) and ex A. Rich. Fl. Abyss. ii. p. 82 (1851).

Barra de Dande and Loanda.—A small tree, 8 or rarely 12 ft. high, usually in the form of a shrub, but when well developed always tree-like, with a single slender trunk and a dilated head ; leaves resembling those of an alder, pallid green, very rough above, more or less softly shaggy beneath ; flowers milk-white or yellow-whitish ; drupe baccate, ovoid-globose, sordidly cinnabar-red or orange-scarlet, very viscid, fleshy, monopyrenous, mucronate with the remains of the style, seated on the 5- to 7-toothed calyx ; putamen very hard, bony, 4-celled or rarely by abortion 3- or 2-celled, quadrangular-pyramidal, truncate at the apex ; the seeds solitary in the cells. In rough hilly

places by thickets near Barra de Dande and thence extending over nearly the whole coast districts as far as the mouth of the river Cuanza, not uncommon; fl. from Jan. to the beginning of June; fr. Nov. 1853. No. **5423**. In hilly bushy places in the coast region: fr. June and July 1858. Coll. Carp. 755.

Golungo Alto.—No notes. In fl. and fr. No. **5431**.

Bumbo.—A small tree of 8 to 12 ft., spreading widely at the head; flowers whitish; fruit sulphur in colour, edible, rather viscid. In thickets near Bumbo; fl. and fr. Oct. 1859. No. **4783**.

C. rubra Hochst. has been referred, perhaps correctly, to *C. ovalis* Hochst. in Pl. Schimp. Abyss. ii. n. 1218 and ex Alph. DC. in DC. Prodr. ix. p. 479 (1845), non R. Br.; but the latter has longer and slenderer petioles; both have been reduced by A. Richard, *l.c.*, to *C. Myxa* L. Sp. Pl., edit. 1, p. 190. A plant collected by Hildebrandt, n. 624, in July 1872 at Habâb, in Abyssinia, reaching 13 ft. in height, with edible fruit, which was identified with *C. subopposita* DC. by Vatke in Linnæa xliii. p. 315 (1882), belongs to *C. rubra*.

2. **C. subopposita** DC. Prodr. ix. p. 480 (1845).

C. ovalis R. Br. in Salt Abyss. App. iv. p. lxiv. (1814), name only; non Hochst. nec Alph. DC. in DC., *l.c.*, p. 479. *C. myxa* Forsk. Fl. Ægypt.-Arab. p. lxiii. n. 136 (1775); non L. *Cornus sanguinea* Forsk., *l.c.*, p. 33, non L.

Barra de Bengo.—A small tree, 7 to 10 ft. high; trunk erect, divaricately branched towards the apex: leaves subopposite, scabrous; flowers from whitish to slightly yellowish; drupes orange-yellow, very viscid. In dry hilly places amongst shrubs, in company with Capparideæ and *Agialid ægyptiaca* O. Kuntze, var. *angolensis*, between Teba and Cacuaco; fl. and fr. April and May 1854. Also plentiful near Loanda. No. **5421**.

Loanda.—A branched tree, 6 to 15 ft. high, with the habit remarkably like that of some arborescent species of *Solanum*; branches erect-spreading. In maritime thickets near Maianga d'El Rei, plentiful; fl. and young fr. beginning of April 1854. No. **5422**. No notes. In fl. No. **5468**.

The following Nos. should be compared with this species:—

Ambriz.—In fr. Nov. 1853. No. **5453**.

Benguella.—Sticks used for obtaining fire, June 1859. Coll. Carp. 756. This perhaps belongs to the *Cordia* mentioned in Welwitsch's diary, 18 June 1859, S.E. Benguella, as an arborescent shrub with lanceolate leaves, occurring also at Loanda.

Mossamedes.—A small tree; taking root as pitchers by fences in gardens at Mossamedes; fl.-bud and fr. July 1859. No. **4781**.

3. **C. pilosissima** Baker in Kew Bull. 1894, p. 28.

Bumbo.—A small tree of 8 to 15 ft., very elegant, with a quite lax head and flowers whitish-violet in colour. In open forests at the foot of the mountains of Serra da Xella, near Bruco; scarcely in full fl. Oct. 1859. No. **4784**.

4. **C. chrysocarpa** Baker in Kew Bull. 1894, p. 27.

Golungo Alto.—A tree, 20 to 30 ft. high; fruit drupaceous, grape-shaped, shining, yellow; fruiting calyx hardened, ashy-green. At the outskirts of the forest in the ascent to Capopa; fr. March 1856. No. **5461**. A lovely tree. At Undelle; fr. June 1856. Probably this species. Coll. Carp. 753.

5. **C. longipes** Baker in Kew Bull. 1894, p. 27.

Golungo Alto.—A strong tree, 20 to 30 ft. high ; branches patent, as well as the branchlets and leaves sometimes scattered, sometimes ternate ; leaves very large, deciduous, very rough above, discolorous ; calyx tubular, densely lepidote-tomentose outside, bursting at the apex into 2 to 4 very unequal teeth, obscurely 10- to 12-furrowed ; corolla sulphur in colour ; the tube exceeding the calyx ; the limb rotate, 5- to 7-cleft ; the lobes soon reflected, obovate or oblong ; stamens 5 or 6, inserted at the corolla-throat, alternate with the lobes of the limb ; ovary ovoid-conical, acuminate at the apex, alternate at the apex into the style ; style bipartite almost to the base, the branches bifid to the middle, the branchlets thickened upwards and stigmatose ; fruit drupaceous, grape-shaped, an inch long, yellowish, ovoid-conical, mucronate at the apex, seated on the hardened ashy cupuliform calyx. In primæval forests among the mountains of Sobato de Bumba, etc. ; in late fl., 19 Nov. 1855. No. **5428**. Flowers from whitish to yellowish ; fruit grape-shaped, yellow. At Undelle ; fl.-bud, Feb. 1856. No. **5432**. A tree of 20 to 25 ft. or usually a small tree of 6 to 10 ft. ; flowers yellow ; drupes like a cherry in size and shape, sulphur-coloured, very viscid with a dense mucus, turgid, monopyrenous by abortion ; seeds 2 or 3. In secondary woods near Sange ; ripe fr. July 1857. Perhaps this species. Coll. Carp. 754.

The following No., represented by a leafy shoot, should be compared with this species :—

Golungo Alto.—A moderate-sized tree, with the habit almost of a *Ficus*, a dilated head, and spreading branches. In the forest at N-delle ; without either fl. or fr. June 1855. No. **5456**.

6. **C. abyssinica** R. Br. in Salt Abyss. App. iv. p. lxiv (1814), name with reference ; A. Rich. Fl. Abyss. ii. p. 80 (1851).

Varronia abyssinica DC. Prodr. ix. p. 469 (1845).

Var. *β.* **acutifolia** A. Rich., *l.c.*

Golungo Alto.—A lofty tree, very ornamental in flower ; trunk 2 to 2½ ft. in diameter at its base, usually ascending ; flowers white ; calyx 10-ribbed, normally and unequally bursting at the apex ; corolla funnel-shaped, very thin in texture, the limb somewhat 5-lobed, lobes obcordate ; stamens 5, inserted at the middle of the corolla-tube ; filaments from a broad base filiform above, bearded at the middle with hyaline pilose hairs ; anthers incumbent, oblong-cordate, 2-celled, the cells laterally dehiscent ; ovary free, surrounded with a tender cupuliform membrane ; ovules few ; style elongated, bilobed above the middle, the branches again divided, so that there are 4 ligulate stigmas. At the banks of the river Quiapoze, rather rare ; fl. 17 May 1855. No. **5433**.

The two following Nos., represented by leafy shoots or foliage only, should be compared with this species and also with the Kilimanjaro plant *C. Holstii* Gürke in Engl. Pfl. Ost-Afr., C., p. 335, t. 41 (1895).

Golungo Alto.—A small tree with the habit almost of *Papyrius japonica* Poir., one of the plants called by the natives "Quibosa Camuchito," that is, "Quibosa of the woods," a name which is applied to various trees, shrubs, and even herbs, that serve for the manufacture of ropes. Bança do Sobato de Quilombo ; without fl. or fr. Jan. 1855.

No. **4791**. Leaves of the young branch of the tree from which flowers had been previously gathered. Roadway near Mussengue, at the foot of the saltpetre cavern, Jan. 1856. No. **5462**.

7. **C. aurantiaca** Baker in Kew Bull. 1894, p. 26.

Golungo Alto.—An evergreen, much branched tree, 20 to 25 ft. high; inner bark very tenacious, textile; leaves rather fleshy, subcoriaceous; inflorescence ebracteolate; calyx dusky-tomentose, ribbed with 10 folds of which 5 are strongly prominent, tubular, but little cleft at the apex, deeply crenate; corolla saffron-yellow, salver-shaped, embracing the germen at the bottom of the calyx about the base; the tube ribbed; the limb 5- or almost oftener 6-cleft; the lobes oblong, pervaded with 3 thick folds, more or less undulate at the margin, produced at the apex into a subulate pilose appendage, convolute-plicate in æstivation, patent in flower, soon reflected; stamens 5 or 6, inserted a little below the corolla-throat, exserted; anthers cordate-oblong, dorsifixed, introrse, 2-celled, longitudinally dehiscing; ovary globose, free, subsessile, smooth; style-branches bifurcate; stigmas 4, green, peltate-capitate, exserted; drupe baccate, monopyrenous, mostly 2-celled; putamen rather bony; seeds solitary. In the less dense forests and at the banks of rivulets, near Bango, Menha-Lula, etc., not plentiful; fl. Dec. 1854 and July 1855 No. **5430**. A tree of 15 to 20 ft. with its trunk 6 to 9 in. in diameter at the base (about the negro villages it is usually only a shrub of 8 to 10 ft., as it is in such places continually mutilated); branches erect-spreading or patent, a little tortuous; leaves coriaceous, rigid, evergreen, dull green above, much paler beneath, the blade usually concave and curved inwards beneath with the margin variously inflected; flowers in colour sulphur varying to orange; calyx tubular, 10-ribbed, folded between the ribs; the limb short, 4- or 5-cleft; corolla-limb 5- to 7-cleft; the lobes at the base longitudinally at the middle and apex transversely plicate-wavy, with a long abrupt limp mucro at the apex; stamens 5 to 7, alternating with the corolla-lobes; style filiform, with two dichotomous branches; stigmas 4, peltate, greenish; drupe sulphur in colour, as large as a hazel nut. At the outskirts of forests nearly everywhere, but solitary and not in groups; near Sange, Bango, the Luinha, etc.; fl. June 1856. No. **5429**. No notes; fl. No. **5466**. A tree of 20 to 25 ft., with yellow flowers and textile inner bark. At Bango; fl. and fr. Jan. 1855. Coll. Carp. 751. A tree of 15 to 20 ft., with very tenacious inner bark, intensely yellow-tawny flowers, and the ripe capsules turning yellow. At Bango; fr. Sept. 1855. Coll. Carp. 752. Native name "Quibosa ia muchito."

This is apparently one of the species of *Cordia* referred to by Welwitsch, Synopse Explic., p. 15, n. 35 (1862), under the native name of "Quibosa iã mugito," as trees of low elevation growing in the dense forests of this district; he states that the inner bark is frequently utilised for making ropes; and on account of its great durability it is highly valued by the natives. See also Ficalho, Pl. Uteis, p. 225.

No. **5457** from Pungo Andongo, without notes, is a poor specimen in flower; it should be compared with *C. aurantiaca*.

The following No. belongs apparently to an undescribed species of *Cordia*:—

A small tree with a lax head, 9 ft. high or a little more; branchlets somewhat angular and tawny, leafy, tomentose towards the tips; leaves broadly and irregularly oval or somewhat rhom-

boid, shortly pointed at the apex, obtuse or scarcely rounded at the base, very scabrid and not pubescent above, shortly hispid on the reticulations beneath, 2 to 4 in. long by $1\frac{1}{2}$ to $3\frac{1}{4}$ in. broad, rigidly sub-coriaceous; petiole $\frac{1}{2}$ to $\frac{3}{4}$ in. long, scabrid; infructescence opposite a subterminal leaf, lax, about 2 in. in diameter; fruits few, ovoid, rather obtusely pointed, nearly an inch long, received at its base into the scabrid shortly 5-cleft calyx which is about $\frac{1}{3}$ in. long.

Huilla.—In wooded places at the large lake near Mumpulla, sporadic; fr. Oct. 1859. No. **4782**.

2. **EHRETIA** Browne; Benth. & Hook. f. Gen. Pl. ii. p. 840.

1. **E. obtusifolia** Hochst. in Pl. Schimp. Abyss. ii. n. 652 (*U.i.*, 1842), and ex Alph. DC. in DC. Prodr. ix. p. 507 (1845).

E. obovata R. Br. in Salt, Abyssinia, App. iv., p. lxiv. (1814), name only.

Bumbo.—A shrub, 3 to 5 ft. high; branches sparse, rambling, virgate; flowers gamopetalous, pentamerous, whitish; fruit drupaceous, red. In hot bushy wooded places between Quitive and Bumbo, sparingly; fl. and fr. Oct. 1859. No. **4785**.

Our plant differs from the type by the repand-crenulate margin of the upper half of the leaves.

2. **E. angolensis** Baker in Kew Bull. 1894, p. 29.

Loanda.—Leaves coriaceous, glossy, pallid beneath, evergreen; flowers of a fine clear blue colour verging on violet; calyx sub-campanulate, 5-cleft beyond the middle; corolla hypogynous, funnel-shaped; the limb 5-cleft, perpendicularly reflected; stamens 5, inserted on the corolla-tube; anthers lanceolate-linear, exserted by reason of the reflection of the corolla-limb; ovary 4-celled; ovules solitary in the cells; style bifid half way; stigmas 2, flattened-capitate; berry 4-pyrenous, of a deep orange colour, as large as a rather small pea, umbonate with the remains of the style; pyrenes 2-celled, the larger cell empty. In barren thickets about Loanda, Cacuaco, Quifandongo, etc., plentiful; fl. Oct. and Nov., fr. Jan. and Feb.; fl. again and soon fr. again. No. **5444**. A shrub, 4 to 6 ft. high, branched from the base; flowers deep blue; fruit drupaceous, coriaceous. At Quicuxe; fl. March 1859. No. **5463**. A lovely shrub, 4 to 6 ft. high, with the habit more or less of a lilac; leaves glossy, evergreen; flowers cymose, of a fine blue colour. In thickets; fr. Nov. 1853. Coll. Carp. 760.

Libongo.—A shrub of 4 to 6 ft., with thinly coriaceous leaves, deep and afterwards pale blue flowers, and scarlet fruit. In thickets about Banza de Libongo, plentiful; fl. Sept. 1858. No. **5446**.

3. **E. scrobiculata** Hiern, sp. n.

A small tree; branches rambling, virgate, patent or nodding; branchlets subterete, inconspicuously striate, glabrescent; leaves alternate, oval or oval-ovate, cuspidate at the apex, rounded or subcordate at the base, glabrous or nearly so, thinly coriaceous, rather glossy, green on both faces, 5 to 6 in. long by 3 to $3\frac{1}{2}$ in. broad, entire; lateral veins about 7 or 8 on each side of the midrib, rather slender, narrowly depressed on the upper face, in relief with a small pit in each axil on the lower face; petiole $\frac{3}{8}$ to $\frac{1}{2}$ in. long; flowers whitish, sessile subsessile or on short pedicels,

arranged in terminal scorpioid spreading pilose-puberulous cymes of 8 in. in diameter and 5 in. in length; calyx hemispherical, $\frac{1}{12}$ in. long, puberulous, 5-cleft; the lobes deltoid; corolla broadly funnel-shaped; the tube about equalling the calyx; the lobes of the limb 5, oval-oblong, obtuse, about $\frac{1}{8}$ in. long, reflected; stamens 5, inserted at the corolla-throat between the lobes, exserted, glabrous; filaments $\frac{1}{8}$ in. long; anthers $\frac{1}{20}$ in. long; style glabrous, shortly bifid, $\frac{1}{10}$ in. long; ovary ovoid, $\frac{1}{20}$ in. long, 4-celled.

Prince's Island.—In a wooded place in the maritime part of the island; only one tree seen, and on this only one branchlet in fl., Sept. 1853. No. **5465**.

This is related to *E. cymosa* Thonn., but differs by larger and broad-based leaves with pits in the axils of the lateral veins beneath.

3. **COLDENIA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 841.

1. *C. procumbens* L. Sp. Pl., edit. 1, p. 125 (1753).

C. angolensis Welw. Apontam. p. 591, n. 104.

Barra do Dande.—In clayey-sandy and muddy places, flooded in summer but dry at the time, about lakes on the right bank of the river Dande, near Bumbo, plentiful; fr. Sept. 1858. No. **5445**.

Barra do Bengo.—An annual prostrate herb, bright green in the living state; leaves not so plicate as in specimens growing in dry places; flowers white. By pools in hilly places near Cacuaco; fl. and fr. March 1854. No. **5438**.

Loanda.—An annual herb, divaricately branched from the crown of the root; branches distichously ramulose, 2 to 4 ft. long, decumbent or even adpressed to the ground; leaves distichous, unequal-sided, coarsely dentate, the nerves running out towards the sinuses between the teeth; corolla 4-cleft, white; stamens 4. Plentiful but only in a few places about drying-up pools, near Represa de Luis Gomes; fl. and fr. Nov. 1853 and April 1854. No. **5436**. An annual, prostrate herb, ashy-hoary with adpressed rigid white hairs; leaves soft, unequal-sided, obovate-olong, deeply crenate, almost crenate-lobulate: flowers white, very fugacious, not uncommonly extra-axillary, of various sizes on the same plant; calyx and corolla always 4-cleft; corolla-lobes obtuse, somewhat spreading at the time of the flower; corolla whitish cream in colour, only in the middle of the branchlets of the fully developed stem, almost shorter than the calyx or equally long; germen glabrous. In muddy dried-up parts of rain-pools near Alto das Cruzes, plentiful but only in a few spots, flowering from April to July and again in Nov. and Dec.; fl. and fr. May and July 1858; at Represa de Luis Gomes, fl. and fr. 14 July 1858. No. **5437**. In hot places about dried-up marshes, from 20 to 25 miles towards the east from Loanda; fr. Sept. 1858. Coll. Carp. 757.

4. **HELIOTROPIUM** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. p. 843.

1. **H. supinum** L. Sp. Pl., edit. 1, p. 130 (1753).

Mossamedes.—In sandy places by the banks of the river Bero, plentiful; not in full fl., Aug. 1859. No. **5286**. An annual, prostrate, much-branched herb, green in the living state, quickly turning hoary in drying; flowers white. In rather dry places, in company with species of *Arthrocnemum* (Welw. herb. no. 6329) and *Heleochloa*

schœnoides Host (herb. no. 2622), near San João de Caroca ; fl. 2 Sept. 1859. No. **5287.**

2. **H. anchusanthum** Hiern, sp. n.

A silky-tomentose canescent herb, perennial or at least lasting for several years ; rhizome somewhat woody ; stems several, oblique or ascending, divaricately branched, somewhat wiry; leaves alternate, oval or ovate, obtuse at the apex, often but not always wedge-shaped at the base into the petiole, rather thickly herbaceous, entire or subrepand on the margin, $\frac{1}{2}$ to $1\frac{1}{4}$ in. long by $\frac{1}{5}$ to $\frac{3}{4}$ in. broad ; lateral nerves about 3 on each side, not conspicuous ; petioles ranging up to $\frac{3}{4}$ in. long ; scorpioid spikes axillary and sub-terminal, ranging up to $3\frac{1}{2}$ in. long ; flowers large for the genus, subsessile, centripetal, $\frac{1}{3}$ to $\frac{3}{8}$ in. long, contiguous ; calyx $\frac{1}{4}$ to $\frac{1}{3}$ in. long, oblong, mostly pentamerous, hairy on both faces, densely so outside, the partitions lanceolate-oblong, erect, connivent or cohering far up in flower, less so in fruit, subobtuse or scarcely acute ; corolla pale yellow, cylindrical, shortly exceeding the calyx ; the tube slightly tapering upwards, pilose above on both faces ; the limb short, glabrous, plicate in bud ; the folds 5, sinistrorsely convolute as seen from above ; the lobes shallow, broad, rounded above ; anthers 5, lanceolate, glabrous, about $\frac{1}{20}$ in. long, subsessile, inserted below the middle of the corolla-tube ; pistil $\frac{1}{16}$ (in flower) in. long, glabrous ; style dilated at the apex into a depressed conical tip or stigma ; nutlets (in one case) 3 with a fourth abortive one, obliquely ovoid, $\frac{1}{15}$ to $\frac{1}{12}$ in. long.

Mossamedes.—In rocky maritime places near Praia da Amelia, sparingly ; fl. and fr. beginning of July 1859. No. **5296.** On the sandy heights of Porto de Pinda ; fl. and fr. 31 August 1859. No. **5295.** Between Cabo Negro and Mossamedes, with luxuriant herbage ; fl. 3 Sept. 1859. No. **5297.**

This must be compared with *H. Olivcrianum* Schinz in Verh. Bot. Brandenb. xxx. p. 268 (1888), a species from the neighbourhood of Walfisch Bay, the type of which I have not seen.

3. **H. curassavicum** L. Sp. Pl., edit. 1, p. 130 (1753).

Mossamedes.—A perennial, suffrutescent, widely cæspitose herb ; stems prostrate, as well as the leaves glaucous-green fleshy and rather rigid ; flowers white, the corolla-limb more or less variegated with purple and somewhat undulate. In muddy-sandy places about brackish marshes near Aguadas, abundant ; fl. and fr. July 1859. No. **5293.** Succulent. At Aguadas ; fl. July 1859. No. **5435***b*.

4. **H. undulatum** Vahl, Symb. Bot. i. p. 13 (1790); J. A. Schmidt, Beitr. Fl. Cap. Verd. Ins. p. 225 (1852).

Cape de Verde Islands.—In sandy places on St. Vincent Island ; fl. and fr. Jan. 1861. No. **5467.**

5. **H. ovalifolium** Forsk. Fl. Ægypt.-Arab. p. 38 (1775).

H. Coromandelianum Retz, Fasc. Obs. Bot. ii. p. 9 (1781). *H. cinereum* R. Br. in Salt, Abyss., App. iv., p. lxiii. (1814).

Barra do Bengo.—By dried-up marshes and by the river Bengo near Santo Antonio, at Panda ; fl. and fr. Dec. 1853. No. **5443.**

Icolo e Bengo.—In places flooded in summer near Funda; fl. and fr. Sept. 1857. No. **5435.**

Loanda.—Represa do Luis Gomes at Alto das Cruzes; fl. and fr. Feb. 1854. No. **5439.** Annual; flowers whitish. In damp drying-up places near Imbondeiro dos Lobos: fl. and fr. March 1858. No. **5442.** An erect, annual herb, with the habit of a *Myosotis*, branched from the base; primary stem straight, erect: lateral branches ascending; flowers whitish. In nearly dried-up marshy places near Alto das Cruzes, and at the margins of lakes (near Funda): plentiful: fl. and fr. 14 April 1858. No. **5441.** An annual herb, pleasantly green in the living state, quickly turning grey-hoary when dried: stem oblique; branches spreading; flowers white. By drying-up pools between Bemposta and Camama; fl. and fr. July 1858. No. **5440.**

Cazengo.—An erect, hispid-scabrid, annual herb, with the habit of an *Echinospermum*, 1½ to 3 ft. high; flowers whitish. At the outskirts of primæval forests near the banks of the river Luinha, but only in a few spots; fl. and fr. end of Dec. 1854. No. **5447.**

Mossamedes.—A decumbent-ascending, hoary herb, with white flowers. In sandy maritime and hilly dry places at Praia da Amelia, plentiful; fl. and fr. July 1859. No. **5290.** In the sandy bed of the river Bero; fl. Aug. 1859. No. **5289.** In gravelly places by the banks of the river Bero; fl. and fr. 14 June 1860. No. **5288.**

6. **H. strigosum** Willd. Sp. Pl. i. p. 743 (1797).

Pungo Andongo.—An erect herb, with the aspect of an *Echinospermum;* flowers from whitish to slightly yellowish. In the hot parts of Pedras de Guinga, plentiful; fl. and fr. Jan. and March 1857. No. **5451.** An annual herb, 4 in. or scarcely a foot high, rather rigid, of a pleasant bright green colour in the living state, at length turning hoary in drying; flowers whitish; style apparently terminal. In hot wooded rather sandy parts of Mutollo, by Pedras de Guinga, in company with myosotis-like Rubiaceæ; fl. and fr. March 1857. No. **5454.** At Pedras de Guinga, Cuanza; fl. and fr. No. **5455.**

Mossamedes.—A shrublet, 1 to 2 ft. high; stems numerous, woody at the base, the wood remarkably yellow; epidermis whitish, separating in flakes; leaves linear, rather rigid. In red-sandy rocky places at the base of Serra de Montes Negros; fl.-bud 10 Aug. 1859. No. **5299.** No notes; in fl. No. **5298.**

7. **H. erosum** Lehm. in Neue Sch. Naturf. Ges. Halle, iii. 2, p. 15 (1817).

Cape de Verde Islands.—An annual herb; stem erect or usually ascending; leaves pleasantly green; flowers whitish or rarely pale yellowish. In uncultivated rocky places about Cidade de Praia in the island of St. Jago, plentiful; fl. and fr. Jan. 1861. No. **5470.**

This plant bears a very close resemblance to *H. undulatum* Vahl.

8. **H. indicum** L. Sp. Pl., edit. 1, p. 130 (1753).

Heliophytum indicum DC. Prodr. ix. p. 556 (1845); Welw. Apontam. p. 589, n. 65 (1859).

Libongo.—A pleasing herb, but scentless, with deep green leaves and whitish violet or quite violet-coloured flowers. About Banza de Libongo, very plentiful; fl. and fr. Sept. 1858. No. **5458.**

Icolo e Bengo.—An erect herb, 3 ft. high, branched above. In sandy moist places at the river Zenza near Tandambondo; fl. and fr. Sept. 1854. No. **5427.**

Loanda.—An annual, much-branched herb of 2 to 4 ft., in shady

wooded places not uncommonly 5 ft. high and almost shrubby, or in poor hot stations only 1 to 2 ft.; branches and branchlets patent; flowers lilac, scentless. Plentiful, especially about dwellings and in the city of Loanda itself (in the Bungo quarter), flowering and fruiting nearly throughout the year; July 1858. No. **5459**.

Calumbo.—An annual, erect, branched herb, 2 to 3 ft. high, with violet-coloured flowers. Between Camama and Calumbo; fr. Aug. 1858. Coll. Carp. 758.

Golungo Alto.—A herb, sometimes a foot high, in other cases 3 or even 4 ft., luxuriating with comparatively gigantic leaves. In hot, dry, and also in damp places, plentiful everywhere by streets, houses, etc., flowering nearly the whole year; at Sange, March 1855. No. **5460**.

Prince's Island.—On the sea-coast; fl. Sept. 1853. No. **5464**.

9. **H. longiflorum** Hochst. & Steud. in Pl. Schimp. Arab. n. 842 (*U. i.*, 1837), and ex Alph. DC. in DC. Prodr. ix. p. 555 (1845).

Mossamedes.—Flowers white. In sandy places at the banks of the river Bero; fl. and fr. July 1859. No. **5291**. A suffrutescent, patently branched, decumbent-erect herb, apparently annual: leaves deep green, membranous, rather rough; flowers white, in size and shape like the Peruvian species, also sweetly redolent of Vanilla. In reed-beds at the mouth of the river Giraûl, rather rare; fl. and fr. July 1859. No. **5294**.

10. **H. zeylanicum** Lam. Encycl. Méth. iii. p. 94 (1789).

H. gracile R. Br. in. Salt, Abyss, App. iv., p. lxiii (1814). *H. micranthum* Welw. Apontam. p. 591, n. 98 (1859).

Ambriz.—At Ambriz; in late fr. Nov. 1853. No. **5452**.

Icolo e Bengo.—In moist places flooded in summer, near Foto: in late fr. Sept. 1857. No. **5434**.

Loanda.—An erect, annual, herbaceous-green herb; flowers whitish; calyx 5-partite to the base; corolla bulbous-urceolate; the limb 5-cleft; the lobes subulate, spreading; ovary 4-celled; style terminal, comparatively elongated; stigma urceolate-oblong, woolly-fimbriate at the apex. By dried-up marshes near Mutollo and Cacuaco, rather rare; fl. and fr. April 1854. No. **5426**. An annual, erect, deep green, scopariously branched herb; flowers whitish, turning rufous-dusky in drying. In damp drying-up places after flooding, near Bemposta; fl. and fr. March 1858. No. **5424**. A bright green, erect, annual herb, a foot high; leaves narrow; spikes very slender, sub-erect; flowers very small, whitish. In grassy depressions flooded in summer, between Penedo and Conceição; fl. and fr. May 1858. No. **5425**.

Mossamedes.—Erect, annual; flowers yellow. In sandy places at the banks of the river Bero; fl. and fr. July 1859. No. **5292**.

5. **BORRAGINOIDES** Boerh. ex Ludw. Defin. Gen. Pl., edit. Boehmer, p. 18, n. 58 (1760).

Pollichia Medik. Bot. Beob. Jahr. 1783, p. 247 (1784); non Schrank. *Trichodesma* Br. Prodr. p. 496 (1810); Benth. & Hook. f. Gen. Pl. ii. p. 845.

1. **B. zeylanica.**

Trichodesma zeylanicum Br., *l.c.* *Pollichia zeylanica* F. Muell. Syst. Cens. p. 100 (1882). *Boraginella zeylanica* O. Kuntze, Rev. Gen. Pl. ii. p. 435 (1891).

Huilla.—A perennial herb; stems several, oblique or nearly erect; flowers whitish blue. In rocky pastures amidst low bushes, between Mumpulla and Nene, sparingly; fl. Oct. 1859. No. **5301**.

2. **B. physaloides.**

Friedrichsthalia physaloides Fenzl, Nov. Stirp. 7 Dec., p. 54 (1839). *Trichodesma physaloides* Alph. DC. in DC. Prodr. x. p. 173 (1846). *T. Ambacensis* Welw. Apontam. p. 589, n. 73 (1859). *Boraginella ambacensis* and *B. physalodes* O. Kuntze, *l.c.*

Ambaca.—A glaucescent herb, 2 to 3 ft. high; root perennial: stems numerous, ascending, branched in a paniculate manner and flowering above; leaves very bright green, rough; flowers of a very deep clear blue colour, handsome, nodding; calyx enlarged after the flowering, vesicular-inflated; fertile nucules (by abortion) 2, closely connected, bearing down the aborting nutlets together with the style, at length tumid and disk-like and concealing them, so that the style in the ripe fruit is declinate at the base of the developed nutlets. In the elevated wooded mountainous places at the north-west of the district, near Puri-Cacarambola, plentiful; fl. and fr. middle of Oct. 1856, in company with *Marsea spartioides*; Welw. herb. no. 4005. No. **5450**.

Welwitsch strongly recommended this plant to the attention of horticulturists. A similar plant was collected at Caconda by Anchieta; it is called there "cafucuto" (Ficalho ms.).

3. **B. africana.**

Borago africana L. Sp. Pl., edit. 1, p. 138 (1753). *Pollichia africana* Medik., *l.c.*, p. 248; J. A. Schmidt, Beitr. Fl. Cap. Verd. Ins. p. 227 (1852). *Trichodesma africanum* R. Br. ex Roem. & Sch. Syst. Veg. iv. p. 69 (1819). *Boraginella africana* O. Kuntze, *l.c.*

Mossamedes.—Leaves bright green; corolla white, yellowish at the bottom, the lobes of the limb acute. In sandy places at the banks of the river Bero; fl. and fr. beginning of July 1859; fr. beginning of June 1860. A small-flowered form. No. **5303** and Coll. Carp. 102.

Cape de Verde Islands.—Near Villa da Praia in the island of St. Jago, plentiful; fl. and fr. Jan. 1861. No. **5471**.

4. **B. Medusa.**

Trichodesma Medusa Baker in Kew Bull. 1894, p. 29.

Huilla.—A herb, probably annual, 4 ft. high, strongly branched, with the habit of *Echium*; stems several, leaves subcoriaceous, bright green; flowers clear blue; nutlets 2 or 3, rarely 4. In rather dry thickets on the Humpata plateau, rather rare; fl. 23 April 1860. In company with *Franchetella arborescens* O. Kuntze, var *stenophylla*; Welw. herb. no. 2508. No. **5302**.

The same plant was found by Anchieta at Caconda.

6. **CYNOGLOSSUM** Tourn., L.; Benth. & Hook. f. Gen. Pl. ii. 848.

1. **C. lanceolatum** Forsk. Fl. Ægypt.-Arab., p. 41 (1775).

Loanda.—At Quicuxe; fl. 7 Feb. 1859. No. **5448**.

Golungo Alto.—An erect, hispid, bright green, rather rigid, annual or biennial herb, 2 to 4 ft. high, with the aspect also of an *Echinospermum*; branches spreading; flowers minute, milk-white; calyx 5-cleft; the lobes obtuse, hispid-ciliate; corolla urceolate-infundibuliform; the tube short, ample, dilated; the segments of the limb rounded-obtuse, flattened at the time of the flower; the throat crowned

with 5 gibbosities, which do not close the wide throat; stamens included: anthers yellow; ovary 4-lobed; style simple, included, seated at the base on a kind of quadrangular fleshly-inflated gynophore; stigma subcapitate; nutlets 4, distinct, depressed, densely echinate on the dorsal angle, adnate to the base of the style. At the lower thickets by the Ambaca road, fl. from Nov. to Jan., rather rare, Dec. 1855; also in dense forests at the river Luinha: Sange, 21 Nov. 1855. No. **5449**.

Huilla.—An erect, annual or biennial herb, 2 to 3½ ft. high, with the habit of the genus; stem thyrsoidly branched, as well as the leaves softly pilose; racemes mostly forked in terminal branchlets; rachis silky-pilose; calyx obtusely 5-cleft; corolla tubular-funnel-shaped, 5-cleft; the lobes of the limb white, obtuse; the throat nearly closed, as well as the tube violet-purple; stamens inserted a little below the throat, very short; anthers yellowish, subconnate; nutlets 4, globose, hispidulous; style firm, short, rather thick; stigma broadly truncate. In thickets and hot pastures, on hills near Lopollo, not abundant; fl. 10 Jan. 1860. No. **5300**. An annual herb, 2 to 3 ft. high, erect, branched; flowers few, violet-coloured. In hot parts of forests at an elevation of 5000 ft.; near the Monino river, plentiful; fr. Feb. 1860. Coll. Carp. 75.

7. **ECHIUM** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. p. 863.

1. **E. stenosiphon** Webb in Hook. Niger Fl. p. 155. t. 15 (1849); J. A. Schmidt, Fl. Cap. Verd. Ins. p. 226 (1852).

Cape de Verde Islands.—In rocky maritime places in the island of St. Vincent; fl. Sept. 1853. No. **5469**.

LXXXVII. CONVOLVULACEÆ.

The Convolvulaceæ include plants which attract the attention and admiration of the traveller on his first arrival on African soil. *Ipomœa biloba* Forsk. abounds everywhere along the sea-shore, and in the richest luxuriance clothes with verdure the hot sandhills; it pushes along over the sands its purple-red stems, which are not uncommonly 10 to 15 fathoms long, and which in a short space of time are so luxuriantly clothed with leaves and clusters of flowers that often a single plant produces a bright green oasis. *I. stolonifera* Gm., with its small whitish bell-shaped flowers, occurs in like situations and frequently much closer to the sea, so that it is often flooded with the tidal waters. An *Evolvulus*, a *Merremia*, and a *Seddera* are found also in the littoral region, and *E. alsinoides* L. is one of the most abundant plants on the dry hills and sandy pastures of this region. Towards the interior Convolvulaceæ occur more and more frequently in the mountainous region, sometimes as weeds, sometimes forming a pretty green edging to lakes and swamps, or adorning with their beautiful variously coloured flowers the bushes and trees which overhang the rivers and streams, while in the highland region they lose their climbing habit, and, as is the case with many vines, they become erect shrubs; an example of this latter condition is seen in *I. prismatosyphon* Welw., which is plentiful in Pungo Andongo, and forms one of the chief ornaments of the plateaux of that district. *Lepistemon* occurs in Angola only in

the most northern part, between 7° and 9°, and *Dichondra* only in the southern part, about 15° S. lat.

Only three species of *Cuscuta* were met with, one a mountain plant at an elevation of 3000 to 4000 ft.; the second a coast plant between 15° and 16° S. lat.; and the third is not represented in the herbarium; this last has been apparently introduced from Portugal with cultivated seeds or in the soil of flower-pots, and it was noticed in November 1860 as growing sparingly on *Impatiens Balsamina* L. and on a large-leaved species of *Ocimum*, both of which were in cultivation at Loanda; it proved to be *C. Chrysocoma* Welw.

The following are plants of economic use:—1. *Ipomœa Batatas* Poir. and *I. digitata* L. are cultivated in nearly all districts; the negroes eat also the leaves as spinach. 2. *I. biloba* Forsk. might be employed for consolidating sand-hills. 3. *Jacquemontia ovalifolia* Hallier f. is frequently eaten by the negroes like spinach, and is very well flavoured. 4. *Merremia angustifolia* Hallier f. affords good fodder for cattle, and during the dry winter season, just where often no other green food is found, it occurs along extensive tracts. 5. *M. multisecta* Hallier f. produces a substitute for coffee.

Lepistemon africanum Oliv. only is deleterious; it is met with in the mountainous region, where it is covered with stinging hairs, which make cattle avoid the pastures to the same extent as does Casãoção, *Tragia cordifolia* Benth. (Welw. herb. no. 381).

1. **DICHONDRA** Forst.; Benth. & Hook. f. Gen. Pl. ii. p. 879; Hallier f. in Engl. Bot. Jahrb. xvi. p. 569 (1893).

1. **D. repens** Forst. Char. Gen. p. 40, t. 20 (1776); Hall. f., *l.c.*, xviii. p. 82 (1893).

D. evolvuloides Britton in Mem. Torr. Club v. 268.

Var. *β.* **sericea** Choisy in DC. Prodr. ix. p. 451 (1845).

Bumbo.—A herb, creeping far, in habit precisely resembling *Hydrocotyle*; stem rooting at the nodes; the whole plant clothed with ashy silky hairs. In level fields after cultivation of *Arachis hypogœa*, at the base of the mountains of Serra da Xella, especially about Bumbo, plentiful; fr. Oct. 1859. No. 626. A luxuriant specimen growing with the last. No. 626*b*.

2. **EVOLVULUS** L.; Benth. & Hook. f. Gen. Pl. ii. p. 875; Hall. f. in Engl. Bot. Jahrb. xvi. p. 570 (1893).

1. **E. nummularius** L. Sp. Pl. edit. 2, p. 391 (1762); Hall. f., *l.c.*, xviii. p. 85.

E. dichondroides Oliv. in Trans. Linn. Soc. xxix. p. 117, t. 78.

Huilla.—A procumbent herb, rooting at the nodes, deep green, rather fleshy, apparently annual; corolla subrotate, thinly membranous, milk-white, with ovate obtuse lobes; stamens exserted in consequence of the corolla-limb being rotate, but actually shorter than the limb; anthers and style-branches white; capsule 2-celled, the cells 1- or 2-seeded. On dry hills by streams near Lopollo; fl. and fr. 19 Feb.

1860. Also in sunny sandy-muddy places at the Ivantâla lake; fl. beginning of March 1860. No. **6136**.

2. **E. alsinoides** L., *l.c.*, p. 392; Hall. f., *l.c.* *E.* sp. affin. *E. linifolio* L., Welw. Apontam. p. 589, n. 78 (1859).

Var. *α.* **procumbens** Schweinf. Beitr. Fl. Æthiop. p. 94 (1867).

Loanda.—A very slender, annual herb; branches ascending or spreading horizontally; flowers like a blue forget-me-not. On herbaceous hills near Cacuaco, Forte S. Pedro, etc., plentiful; fl. March 1854. No. **6155**. An elegant herb, much branched, annual or very rarely biennial; stems decumbent-prostrate, silvery-silky at the apex, hirsute with hairs spreading in all directions; peduncles 4-bractate; corolla clear blue, twice as long as the calyx. On sunny grassy hills near Alto das Cruzes; fl. and fr. May, June, and beginning of August 1854 and July 1858. No. **6156**.

Ambaca.—In fields near N-gombe; fl. and fr. Oct. 1856. No. **6161**.

Huilla.—Flowers clear blue. In hilly pastures among low bushes, near Catumba, not common; fl. Dec. 1859 and end of March 1860. No. **6255**.

Var. *β.* **erectus** Schweinf., *l.c.*; Hall. f., *l.c.*, p. 86.

Pungo Andongo.—At the sandy margins of the forest near Quisonde; fr. March 1857. No. **6162**.

Some of our forms of the var. *α. procumbens* are very hirsute and agree with the var. *villosissima* Fenzl in Kotschy exsicc. n. 371 ex Dammer in Engl. Pfl. Ost-Afr., C., p. 328 (1895).

3. **CRESSA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 881; Hall. f. in Engl. Bot. Jahrb. xvi. p. 571 (1893).

1. **C. cretica** L. Sp. Pl., ed. 1, p. 223 (1753); Hall. f., *l.c.*, xviii. 87.

Benguella.—In maritime stations to the south of the city, plentiful; fl. June 1859. No. **6138**.

Mossamedes.—A perennial, white-felted herb; flowers whitish, at length dusky. In brackish sandy places about the mouth of the river Giraûl, in company with *Arthrocnemum*, sadly clothing large tracts, not uncommonly deeply buried in the sand; fl. and fr. 19 July 1859. No. **6139**. A low, glaucous-tomentose or shaggy, perennial herb, with white flowers. In brackish wet places near Mossamedes; fr. July 1859. Coll. Carp. 785. In swampy places at Aguadas near Vil. Mossamedes, plentiful, July 1859; also in pastures flooded in the rainy season between Quipola and Mata dos Carpenteiros, without fl. August 1859. A form with pointed leaves. No. **6137**.

4. **SEDDERA** Hochst. in Flora xxvii., Bes. Beil. p. 7, t. 5 (1844); Hall. f. in Engl. Bot. Jahrb. xvi. p. 572 (1893).

Breweria Benth. & Hook. f. Gen. Pl. ii. p. 876 part. non R. Br.

1. **S. Welwitschii** Hall. f., *l.c.*, xviii. p. 88 (1893).

Loanda.—An apparently annual herb, much branched from the base; stem and branches prostrate; flowers white. About pools near Bemposta among rather low bushes, sparingly; fl. and fr. June 1858. No. **6151**. In herbaceous places about Quicuxe and Mutollo; fl. end of April 1854. No. **6152**. A slender shrublet, apparently perennial, or at least persisting for several years; stem elongated; calyx and corolla almost as in *Evolvulus*, but the styles 2, simple, with capitate stigmas, exceeding the sub-included stamens; corolla funnel-shaped,

milk-white; filaments and anthers also the pollen white. In bushy rocky sandy places near Maianga do Povo, rare; fl. and fr. end of Feb. 1858. No. **6153**. A persistent herb: rootstock thick, woody: stems several, 2 to 4 feet long, decumbent, slender, rather rigidly flexible; corolla campanulate, silky-hirsute outside, especially at the back of the lobes; stamens included; stigmas clavate-capitate; ovary 2-celled, the cells 4-ovulate. At the margins of dried-up pools near Quicuxe, rather rare and usually solitary; fl. and fr. 7 Feb. 1859. No. **6154**.

Var. **Bakeri**.

Breweria microcephala Baker in Kew Bull. 1894, p. 68. *S. Welwitschii*, var., Hall. f. in Bull. Herb. Boiss. v. p. 1009 (1897).

Libongo.—A perennial or at least a biennial herb; rootstock giving off numerous oblique stems; flowers whitish. In hilly places among short grass, between the rivers Lifune and Dande; fl. end of Nov. 1853. No. **6159**.

Icolo e Bengo.—A decumbent, bright green herb; root perennial, woody. On dry hills with short herbage near Funda; after the fall of the fl. end of Sept. 1858. No. **6158**.

Loanda.—In hilly elevated grassy places near Mutollo; fr. May 1854. No. **6157**.

2. **S. suffruticosa** Hall. f. in Engl. Bot. Jahrb. xviii. p. 88 (1893).

Breweria suffruticosa Schinz in Verh. Bot. Brandenb. xxx. p. 275 (29 Sept. 1888). *Convolvulus mucronatus* Engl. Bot. Jahrb. x. p. 246 (18 Oct. 1888). *S. mucronata* Hall. f., *l.c.* *B. sessiliflora* Baker in Kew Bull. 1894, p. 68. *B. baccharoides* Baker, *l.c.*

Var. **hirsutissima** Hall. f. in Bull. Herb. Boiss. vi. p. 531 (4 July 1898). *B. conglomerata* Baker, *l.c.*

Loanda and Barra de Dande.—A herb, apparently enduring for several years, although hardly perennial; rootstock many-headed: branches from the base of the very short stem divaricate, ascending, sometimes short, sometimes virgate and elongated, as well as the leaves and flowers rufous-hirsute. On rather dry hilly ground near Cacuaco one specimen, and near Barra de Dande two specimens; fl. and fr. end of Nov. 1853. No. **6160**.

5. **JACQUEMONTIA** Choisy; Benth. & Hook. f. Gen. Pl. ii. p. 874; Hall. f. in Engl. Bot. Jahrb. xvi. p. 578 (1893).

1. **J. capitata** G. Don, Gen. Syst. iv. p. 283 (1837); Hall. f., *l.c.*, xviii. p. 95 (1893).

Convolvulus capitatus Desrouss. in Lam. Encycl. Méth. iii. p. 554 (1789). *Ipomœa capitata* Choisy in DC. Prodr. ix. p. 365.

Amboiz.—Quizembo, Mossul; fr. without foliage. No. **6217**.

Barra do Bengo.—An annual, but little branched herb, sometimes erect and twining, in other cases decumbent and climbing; corolla clear bluish. On a dry hill near Mutollo, plentiful, but seen nowhere else in the district; fl. and fr. May 1854. No. **6215**.

Golungo Alto.—An annual herb; stem patently branched at the base: the lower branches decumbent, the upper ones twining and climbing; flowers pale blue, nearly milk-white, very fugacious: on declivities in Sobato de Bumba, looking towards the river Zenza, sparingly; fl. Sept. 1855. A herb, apparently perennial, running out far and widely; stems numerous; flowers reddish. In hot sparingly

grassy places near Quibolo ; fl. July 1856. No. **6216**. An annual, twining, simple, prostrate herb, with small bluish flowers. On hills amidst plants of *Punica Granatum* L. and species of *Pennisetum*, but only in a few spots ; fl. and fr. end of April 1856. No. **6218**.

2. **J. ovalifolia** Hall. f., *l.c.*, p. 96.

Ipomœa ovalifolia Choisy in Mém. Soc. Phys. Genève, vi. p. 449 (1834) ; Benth. & Hook. Niger Fl. p. 466 (1849). *I. oleracea* Welw. Apontam. p. 589, n. 74 (1859) ; Ficalho, Pl. Uteis, p. 231.

Loanda.—An annual or biennial herb ; stems numerous, branched from the base ; branches elongated, ascending, somewhat ramulose ; leaves rather fleshy, glaucescent-green, soft and almost greasy to the touch ; flowers pale blue ; corolla-lobes 5, obtuse, mucronate ; anthers ovoid, white ; style simple, or cleft from the middle with erect branches and oblong wedge-shaped stigmas, or simple up to the apex with a bilobed stigma and oblong-spathulate never globose lobes. At the margins of pools and in other moist places and even in dry stations behind Loanda ; fl. and fr. June and July 1858. In moist herbaceous places at Museque do Senhor Ricardo, plentiful ; fl. and fr. Jan. 1854. At Represa do Manoel Pereira Van Hunnen ; fl. and fr. July 1854. A luxuriant specimen 6 ft. long ; at Represa do Imbondeiro dos Lobos ; fl. and fr. beginning of August 1858. The boiled or fried plant, especially when eaten with fish, serves as an agreeable vegetable. The natives call it "Bumba Riála." No. **6252**.

Mossamedes.—An edible herb, with rather fleshy leaves and white-bluish flowers. In moist sandy places at the banks of the river Bero (Rio das mortes) ; fl. and fr. July 1859. No. **6121**.

The pollen is without spines.

6. **CONVOLVULUS** Tournef., L. ; Benth. & Hook. f. Gen. Pl. ii. p. 874, partly ; Hall. f. in Engl. Bot. Jahrb. xvi. p. 579 (1893).

1. **C. sagittatus** Thunb. Prodr. Pl. Cap. i. p. 35 (1794) ; Hall. f., *l.c.*, xviii. p. 103 (1893).

Ambaca.—A herb, scarcely annual : root many-headed ; branches sarmentose, virgate, prostrate, spreading in a circle. Amid low bushes and in the drier pastures between Engombe and Puri-Cacarambola, rather rare ; fl. and fr. Oct. 1856. No. **6204**.

Var. **grandiflorus** Hall. f. in Bull. Herb. Boiss. vi. p. 533.

Subvar. **subcordata** Hall. f., *l.c.*, p. 534.

C. Steudneri Engl. Hochgebirgsfl. p. 350 (1892) ; Hall. f., *l.c.*, p. 104 (1893). *C. angolensis* Baker in Kew Bull. 1894, p. 67. *Ipomœa huillensis* Baker, *l.c.*, p. 70.

Huilla.—At Ferrão da Sola ; fr. May 1860. No. **6131**.

The following No. probably belongs to this species ; the pollen is smooth :—

Huilla.—Flowers from whitish to slightly purple or violet-coloured. In bushy pastures at Catumba ; fl. and fr. Dec. 1859. No. **6116**.

7. **SHUTEREIA** Choisy in Mém. Soc. Phys. Genève vi. p. 485 (1834) ; non *Shuteria* Wight & Arn. (1834).

Sanilum Rafin. Fl. Tellur. iv. p. 70 (1836). *Kethosia* Rafin.,

l.c., p. 78. *Hewittia* Wight (1837); Benth. & Hook. f. Gen. Pl. ii. p. 873; Hall. f. in Engl. Bot. Jahrb. xvi. p. 581 (1893).

1. **S. bicolor** Choisy, *l.c.*, p. 486.

Convolvulus sublobatus L. f. Suppl. Pl. p. 135 (1781). *C. bracteatus* Vahl, Symb. iii. p. 25 (1794). *C. bicolor* Vahl, *l.c.* *Hewittia bicolor* Wight in Madr. Journ. Sc., ser. 1, v. p. 22 (1837). *H. sublobata* O. Kuntze, Rev. Gen. Pl. ii. p. 441 (1891); Hall. f., *l.c.*, xviii. p. 111. *Ipomœa benguelensis* Baker in Kew Bull. 1894, p. 69.

Loanda.—A perennial, bright green, densely leafy herb, climbing far and widely; flowers twice as large as in *Thunbergia alata*, deep orange in colour, violet purple at the bottom of the tube. In fields at Loanda, March 1854. Coll. Carp. 761.

Golungo Alto.—A sarmentose-twining herb, quite like a *Thunbergia* in habit; calyx herbaceous-green, the outer sepals larger than the rest; corolla sulphur in colour, atropurpureous inside at the base especially about the insertion of the stamens; stigma capitate. On the lower thickets and on reed-beds; also rarely on the ground, principally in Sobato de Bumba; fl. and fr. July 1855. No. **6225**. A perennial, twining herb, climbing widely but not high: flowers capitate-involucrate; corolla very fugacious; the young ones shortly campanulate, sulphur-yellow, dark purple at the base inside; the limb 5-crenate, 5-plicate; the folds longitudinally pilose-bearded; the beard long, prominent as pencils at the tips of the folds; anthers violet-coloured, comparatively large, thick, curved; stigma capitate-bilobed, the lobes almost totally separate. In bushy woods, climbing on Manhiot, wild; near N-delle, few fl. middle of April 1856; Moangue N-delle; fl. May 1856. No. **6221**.

Ambaca.—Corolla funnel-shaped, pale sulphur in colour, dark purple inside at the bottom; the limb rugose-crispulate, 5-plicate; one stamen constantly higher than the rest; anthers white; stigma bicapitellate, the capitellæ white, ovoid; the old ones furrowed above, diverging at an obtuse angle; capsule 4-furrowed, pilose. In the lower thickets and in rather dry sparingly grassy places near the banks of the river Coango and near Quibixe; fl. and young fr. Aug. 1856. No. **6224**.

Bumbo.—In thickets between Quitive and Bumbo; fr. Oct 1859. No. **6127**.

8. **MERREMIA** Dennst. Schlüss. Hort. Malab. p. 34 (1818); Hall. f. in Engl. Bot. Jahrb. xvi. p. 581 (1893).

Ipomœa Benth. & Hook. f. Gen. Pl. ii. p. 870, partly. *Convolvulus* Benth. & Hook. f., *l.c.*, p. 874, partly.

1. **M. pterygocaulos** Hall. f., *l.c.*, xviii. p. 113 (22 Dec. 1893).

Convolvulus pterygocaulos Steud. in Pl. Schimp. Abyss. ii. n. 630 (*U. i.*, 1842). *Ipomœa pterygocaulos* Choisy in DC. Prodr. ix. 381.

Golungo Alto.—Stem acutely and broadly winged, widely climbing; flowers campanulate, white. In bushy places at the rivulet Cuango, near Canguerasange; fl. Oct. 1854. No. **6164**. Stem twining, climbing high, fleshy, 3-winged: the wings broad, reddish; corolla campanulate, snow-white, coloured inside with a purplish ring which forms a belt above the insertion of the stamens and radiates upwards. By thickets and in reed-beds near Bango and Sange, rather rare; and more plentifully at the base of the Queta mountains; fl. June and July 1855. No. **6143**. At Sange; fl. and fr. June 1856. No. **6165**.

The pollen is globose and not spiny.

Var. (?) **chrysantha** Hiern.

A perennial herb, climbing far and widely; stem very thin, flexuous, broadly three-winged; flowers large, of a sulphur or rarely of a whitish yellow colour, handsome; fruit about $\frac{1}{2}$ in. in diameter; seeds mostly with one curved face and two flat faces, minutely lepidote-puberulous, otherwise glabrous along the squamulose-puberulous angles, about $\frac{1}{5}$ in. long by $\frac{1}{6}$ in. thick.

Golungo Alto.—At the base of the Alto Queta mountains; fr. Aug. 1855. Coll. Carp. 769. At Sange; fr. Aug. 1855. A plant with rather smaller fruits and more puberulous seeds, perhaps distinct. Coll. Carp. 768.

2. **M. umbellata** Hall. f., *l.c.*, p. 114.

Ipomœa umbellata G. F. W. Meyer, Prim. Fl. Esseq. p. 99 (1818).

Prince's Island.—In the lower thickets; fl. Sept. 1853. The pollen grains are globose and nodulose, not spiny. No. **6210**. In fl.; Sept. 1853. In the study set a flower has a funnel-shaped corolla 2 in. long. A poor specimen, perhaps not belonging to this species. No. **6211**.

3. **M. spongiosa** Rendle in Journ. Bot. xxxii. p. 179 (1894).

Ipomœa spongiosa Rendle, *l.c.*. *I. uliginosa* Welw. ex Rendle, *l.c.*

Pungo Andongo.—In fl. No. **6169***b* (= 6196*b*). Flowers whitish with a rosy tinge, plumose-hirsute. In swampy parts of Mutollo, in company with *Scleria*; fl. Jan. 1857. A prostrate herb, with a vertical cylindrical root, and erect secund linear leaves narrower than in the type. No. **6169**. Fr. Dec. 1856. Doubtfully referred here. Coll. Carp. 774.

4. **M. quercifolia** Hall. f. in Engl. Bot. Jahrb. xviii. p. 114 (1893).

Pungo Andongo.—Flowers large, orange-yellow, variegated, atro-purpureous at the bottom. In sandy thickets near Quitage, at the river Cuije; fl. March 1857. No. **6172**.

5. **M. multisecta** Hall., f., *l.c.*, p. 115.

Mossamedes.—A perennial, copiously lactescent herb, branched from the base; stems several, prostrate, 2 to 3 ft. long, cylindrical, rigid, purplish; leaves fleshy, very rigid and brittle, pedatifid-laciniate; peduncles axillary, 1- or 2-flowered, three times as long as the petiole, bibracteolate; capsule spherical, somewhat bisulcate, 2-celled, the cells 1- or very rarely 2-seeded, crowned with the filiform shortly bilobed style; seeds large in proportion to the capsule, plano-convex, smooth. In sandy maritime stations between Mossamedes and Cabo Negro, not uncommon; fr. beginning of July 1859. No. **6112**. A lactescent, perennial herb; roots sinuous, stems prostrate; leaves like those of a *Geranium* or *Pelargonium*. At Praia da Amelia, near Mossamedes; fr. July 859. Coll. Carp. 29.

In company with this plant grew *Zygophyllum simplex* L. (Welw. herb. no. 1573) and *Caucalis mossamedensis* Welw. herb. no. 2500, in Sept. 1859 among gravelly hills towards the mouth of the river Caroca. *Cuscuta planifolia* Ten., var. *mossamedensis* (Welw. herb. no. 6141) grew upon this herb. In the study set a fasciated branch exists. The seeds are used as coffee.

6. **M. pentaphylla** Hall. f., *l.c.*, p. 115.

Ipomœa ægyptia L. Sp. Pl., edit. 1, p. 162 (1753). *Convolvulus pentaphyllus* L. Sp. Pl., edit. 2, p. 223 (1762).

Mossamedes.—An annual, twining herb, with campanulate-funnel-shaped, whitish, comparatively large flowers. In sandy thickets at the river Giraûl, rather rare; fl. July 1859. No. **6118**.

7. **M. tridentata** Hall. f., *l.c.*, p. 116.

Convolvulus tridentatus L. Sp. Pl., edit. 1, p. 157 (1753). *Ipomœa tridentata* Roth in Römer, Archiv. Bot. i. 3, p. 38 (1798); Chois. in DC. Prodr. ix. p. 353 (1845).

Pungo Andongo.—At the sandy banks of the river Cuanza, near Condo; fl. 13 March 1857. No. **6190**.

The pollen is without spines.

8. **M. angustifolia** Hall. f., *l.c.*, p. 117.

Ipomœa angustifolia Jacq. Collect. Bot. ii. p. 367 (1788). *I. filicaulis* E. Mey. in Flora 1843, Beil. p. 159, under n. 34; non Bl.

Var. *β.* **ambigua** Hall. f., *l.c.*

Convolvulus filicaulis Vahl, Symb. Bot. iii. p. 24 (1794). *Ipomœa filicaulis* Chois. in DC. Prodr. ix. p. 353 (1845), partly; non Bl.

Loanda.—A prostrate herb; root long, woody, perennial; the numerous stems and the branches very slender, elongate-virgate, 3 to 8 ft. long, procumbent; leaves narrowly linear, 1½ in. long, subsessile, hastate-auriculate at the base on both sides; auricles acutely bifid, flowers ½ to ⅔ in. long, funnel-shaped, pale yellow. In fields and dry uncultivated places throughout the district, plentiful, occurring during the whole year and usually in flower; fl. and fr. No. **6246**. In fields at Morro das Lagostas; fl. and fr. No. **6247**. Perennial; stem prostrate; runners very long, decumbent; leaves linear-lanceolate, hastate; flowers small, sulphur-coloured; fr. March 1854. Coll. Carp. 762.

Ambaca.—In bushy hilly places on the left bank of the river Caringa, fr. June 1855; also in flat sterile places about Ngombe, fr. Oct. 1856. A riparian plant. No. **6203**.

Huilla.—Fl. and fr. Apparently this species. No. **6122**.

This plant, although very tender, is of great economic use, and furnishes very agreeable fodder for sheep and such-like animals during the dry and barren winter season, from June to September, many domestic animals are fed almost exclusively upon it.

The pollen is without spines.

9. **M. convolvulacea** Dennst. Schlüss. Hort. Malab. p. 34 (1818).

Evolvulus hederaceus Burm. f. Fl. Ind. p. 77, t. 30, fig. 2 (1768). *M. hederacea* Hall. f., *l.c.*, p. 118.

Huilla.—In rocky places at Sambos Morro; fl.-bud Dec. 1859. Doubtfully referred to the above species. No. **6110**.

10. **M. emarginata** Hall. f., *l.c.*, p. 118.

Evolvulus emarginatus Burm. f. Fl. Ind. p. 77, t. 30, f. 1 (1768). *E. Glechoma* Welw. Apontam. p. 589, n. 64 (1859). Cf. *Falkia angolensis* Welw. in Bol. Conselho Ultramar. Lisboa, no. 7, p. 81, n. 29 (August 1854).

Loanda.—A perennial, prostrate herb, with the habit of *Falkia*: branches sarmentose, rooting; calyx 5-sepalous; the three inner segments oblong-obcordate, with a long ciliate fringe at the apex: corolla tubular-campanulate, yellow; capsule 2-celled, the cells 1-seeded. In wooded places nearly dried up after flooding, near

Quicuxe ; fr. March 1854. No. **6149**. A prostrate apparently perennial herb ; stems purple ; leaves almost like those of an ivy ; flowers sessile ; calyx fringed ; corolla yellow. In fields near Quicuxe; fr. June 1858. Coll. Carp. 784. A perennial herb ; root very long, becoming woody in old age ; stems prostrate, frequently rooting at the nodes ; sepals at length rosy-red, the inner ones broadly obcordate, ciliate-fimbriate ; corolla tubular-campanulate, deep yellow almost orange-coloured ; the tube reddish outside, red-striate inside ; style solitary, elongated, ending in two closely connate capitate stigmas (or in one bicapitate stigma); capsule at length rosy-red. In flooded places near Imbondeiro dos Lobos ; fl. and fr. 8 June 1858. No. **6150**.

The pollen is spherical and not spinose.

9. **OPERCULINA** Silva Manso, Enum. Subst. Braz. p. 16 (1836) ; Hall. f. in Engl. Bot. Jahrb. xvi. p. 582 (1893).

Ipomœa Benth. & Hook. f. Gen. Pl. ii. p. 870, partly.

1. **O. tuberosa** Meissn. in Mart. Fl. Bras. vii. p. 212 (1869) ; Hall. f., *l.c.*, xviii. p. 119 (1893).

Ipomœa tuberosa L. Sp. Pl., edit. 1, p. 160 (1753). *I. kentrocaulos* C. B. Cl. in Hook. f. Fl. Brit. Ind. iv. p. 213 (1883). *I. Mendesii* Welw. Apontam. p. 584, n. 12 (1859).

Benguella (and Loanda).—A shrubby twining herb or strong shrub, extensively climbing to a great height, flowering twice in each year ; sap milky ; branches cylindrical, smooth, leaves deep green, not glossy, the nervation of their lobes impressed above, in relief beneath ; flowers tubular-campanulate or funnel-shaped, golden-yellow, paler outside ; sepals variable in shape, occasionally somewhat acuminate, generally obtuse, sometimes even sub-emarginate ; corolla-tube pentagonal about the middle gradually ending in the 5-plicate 10-crenate limb ; 3 of the stamens much taller than the other 2 ; ovary 2-celled, the cells 2-ovulate ; stigma bicapitellate, golden in colour ; capsule 2-celled, as large as a large walnut or as a moderate-sized hazel-nut or as a pigeon's egg, ellipsoidal-globose, blunt at the apex, by abortion usually 2-seeded ; seeds large, quite black, quasi-velvety with thin closely adpressed very black hairs, ovoid, triangular on the outer ventricose face, flat on the other faces, obliquely truncate at the base ; the angles densely clothed with spreading not adpressed black hairs ; the septum of the ripe capsule usually very thin or partly obsolete, so that the capsule seems unilocular ; fruiting sepals 1½ in. long, concealing the capsule. In thickets in Benguella, whence it was introduced into Loanda gardens in 1856 by Dr. Mendes Alfonso ; fl. and fr. in his garden May 1858. No. **6254**. At Loanda; fr. July 1858. Coll. Carp. 766.

Golungo Alto.—A shrub, climbing high and widely ; leaves and flowers handsome. At the outskirts of the primitive forest in Sobato de Mussengue ; seeds from a plant cultivated at Loanda, Oct. 1858 and June 1860. Coll. Carp. 132.

2. **O. kentrocaulos** Hall. f., *l.c.*

Convolvulus kentrocaulos Steud. in Pl. Schimp. Abyss. ii. n. 800 (*U. i.* 1842), and ex Choisy in DC. Prodr. ix. p. 362 (1845). *Ipomœa tuberosa* A. Rich. Fl. Abyss. ii. p. 67 (1851) ; non L.

Golungo Alto.—A herb, apparently perennial, climbing very extensively and to a great height over thickets and upon trees, ornamenting the borders of the forests with its numberless sulphur-

coloured flowers which are open from 10 a.m. to 3 p.m. Roadway leading to Menha-Lula, at the outskirts of the forest and in thickets which luxuriate in places neglected after cultivation, plentiful : fl. and fr. beginning of June 1855. No. **6167**. A twining undershrub, climbing far and high ; flowers very crowded, of a deep sulphur-yellow colour, red at the bottom. By thickets near the borders of the forest, plentiful, at the banks of the river Coango : fl. and fr. July 1855, and in Sobato Mussengue, fr. Aug. 1855. No. **6168** and Coll. Carp. 767.

Pungo Andongo.—At Calundo ; fl. May 1857. No. **6166**.

10. **LEPISTEMON** Blume ; Benth. & Hook. f. Gen. Pl. ii. p. 873 ; Hall. f. in. Engl. Bot. Jahrb. xvi. p. 583 (1893).

Lepidostemon Hassk. Cat. Hort. Bog. Alt. p. 140 (1844).

1. **L. africanum** Oliv. in Hook. Ic. Pl. xiii. p. 54, t. 1270 (1878) ; Hall. f., *l.c.*, xviii. p. 123 (1893).

Ipomœa owariensis P. Beauv. Fl. Owar. ii. p. 41, t. 82 (1818 ?).

Golungo Alto.—A twining, very widely climbing, annual and triennial herb, beset throughout except the corolla with stinging pilose hairs ; calyx 5-cleft, ventricose ; corolla milk-white, salver-shaped constricted at the throat ; the tube ventricose ; the limb spreading, pentagonal ; stamens 5, inserted at the back of large concave connivent scales which are pilose outside and cover the ovary, included ; anthers sagittate, large, 2-celled, introrse, dehiscing longitudinally ; ovary surrounded by a tall rather fleshy truncate cup, sessile, ovoid, appreciably narrowed into the style : style rather thick, gradually attenuate, crowned with the large capituliform stigma, at the time of the flower occupying the centre of the staminal scales and exserted while the remaining parts of the ovary are covered by these scales ; ovary 4-celled, the cells uni-ovulate. At the outskirts of forests and in reedy thickets, plentiful and almost everywhere, in Sobato de Bumba and in Mussengue ; fl. and young fr. May 1855. No. **6145**. A powerfully stinging herb, with white salver-shaped flowers. By reedy thickets near Cacarambola : fl. June 1856. No. **6145*b***. A climbing twining stinging herb ; fr. June 1857. Coll. Carp. 782. A persisting herb ; root tuberous ; stem long, twining, beset with stinging hairs. At the margins of forests in Sobato de Bumba ; fr. beginning of Sept. 1855. Coll. Carp. 780. A twining, widely climbing herb, beset with itching hairs ; flowers white, subcampanulate. At the outskirts of forests in Sobato de Mussengue ; ripe fr. middle of Sept. 1856. Coll. Carp. 781.

11. **IPOMŒA** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 870, partly ; Hall. f. in Engl. Bot. Jahrb. xvi. p. 583 (1893).

1. **I. geminiflora** Welw. Apontam. p. 590, n. 79 (1859) ; Rendle in Journ. Bot. xxxii. p. 174 (1894).

Loanda.—An annual herb, branched from the base : branches elongate virgate, prostrate, scarcely twining, hirsute and reddish at the apex ; leaves glaucous, cordate-ovate, hastate-auriculate, slightly fleshy ; peduncles axillary, in pairs, bracteolate at the base, deflected in fruit : calyx red-glandular ; unexpanded corolla sulphur-coloured, but little or hardly exceeding the calyx ; filaments inserted at the base of the corolla-tube, naked ; anthers nearly triangular, 1 or 2 without pollen ; ovary ellipsoidal-conical, girt at the base with a high discoid ring, 2-celled, the cells biovulate ; style solitary, firm, rather short, crowned

with the bicapitellate stigma. In flooded places, drying up, near Imbondeiro dos Lobos, very rare ; fr. and very few fl. 8 June 1858. No. **6235** (partly).

Golungo Alto.—No notes. In fl. and fr. No. **6235** (partly).

2. **I. eriocarpa** R. Br. Prodr. p. 484 (1810).

Convolvulus hispidus Vahl, Symb. Bot. iii. p. 29 (1794). *I. hispida* Roem. & Schultes, Syst. Veg. iv. p. 238 (1819) ; Hall. f., *l.c.*, p. 123, partly.

Golungo Alto.—Corolla pale rosy, marked within with purple lines. At the Perreira stream ; fl. 15 May 1855. There is in the study set a flower, 1 in. long, 1½ in. in diameter, with obtuse sepals and tubular-funnel-shaped corolla-tube, apparently belonging to a different species. No. **6144**. A prostrate herb, with long sarmentose branches and sordidly whitish flowers. On the more elevated slopes of the Queta mountains amongst sparse herbage ; fl. and fr. Dec. 1855. No. **6231**. A herb, apparently annual, running far along the ground amongst other herbs, stoloniferous and whip-like, sometimes climbing extensively ; flowers pale blue, tubular-campanulate, the limb nearly erect. By fences and the lower thickets near Canaulo on the Ambaca road ; fl. May 1856. The specimens stained paper brown. No. **6232**. A twining herb, annual or triennial ; leaves exceedingly variable in shape, often heteromorphous in one and the same individual plant ; flowers small, campanulate, sometimes white, sometimes red ; by thickets near the banks of the river Delamboa ; fl. and fr. June 1856. No. **6196**. Sepals very unequal ; corolla milk or rarely violet red, funnel-shaped ; the lobes of the limb broad, sub-repand on the margin, obtuse, sometimes keeled on the back, tipped with a very short pencil of slender hairs ; stamens inserted at the base of the corolla-tube, included ; filaments unequal in length, bearded at the base, comparatively large, white ; ovary conical, hirsute, girt at the base with the thin disk ; stigma capitate-bilobed, scarcely exceeding the stamens. Near the banks of the Delamboa ; fl. June 1853, also at Bango (corolla violet-coloured, small, with an erect limb), June 1856. No. **6233**.

3. **I. cynanchifolia** C. B. Cl. in Hook. Fl. Brit. Ind. iv. p. 208 (1883), partly ; Hall. f. in. Bull. Herb. Boiss. vi. p. 538 (1898).

Loanda.—In flooded places, drying up, near Imbondeiro dos Lobos, very rare ; fr. 8 June 1858. No. **6235** (partly).

4. **I. blepharophylla** Hall. f., *l.c.*, p. 125.

Ambaca.—A perennial herb : root thick, nodose ; stems sarmentose, prostrate ; flowers of a pleasant violet-purplish colour or occasionally deep rosy. In dry plains and at the margins of fields, from Izange to N-gombe ; fl. Oct. 1856. This plant stains paper brown. No. **6193**.

5. **I. crassipes** Hook. in Bot. Mag., t. 4068 (1844).

I. calystegioides E. Mey. in Flora, 1843, Bes. Beig. pp. 145, 153, 195 (name) ; Drège ex Choisy in DC. Prodr. ix. p. 431 (1845) ; Hall. f., *l.c.*, p. 127. *I. adumbrata* Rendle & Britten in Journ. Bot xxxii. p. 173 (1894). *Convolvulus ukambensis* O. Kuntze, Rev. Gen. Pl. iii. 2. p. 215 (1898).

Huilla.—On hills, among low bushes near Empalanca, sparingly ; fl. Dec. 1859. Corolla in the dry state widely funnel-shaped, 1⅓ in. long, pale, with short apiculate ciliate lobes. No. **6130**. In sunny places among low bushes at Mumpulla ; fl. Oct. 1859. No. **6128**.

6. **I. hewittioides** Hall. f., *l.c.* (1893).

I. andongense Rendle & Britten, *l.c.*, p. 171 (1894).

Pungo Andongo.—A perennial herb ; root tuberous ; stems prostrate, but little twining, not yet climbing ; flowers from whitish to purple. By the road leading to the bridge at Luxillo ; fl. Dec. 1856. No. **6223**. At Sansamanda ; fl. 1857. No. **6195**.

7. **I. porrecta** Rendle & Britten, *l.c.*, p. 172.

Ambaca.—A perennial herb ; root woody-nodose ; stems several, sarmentose, prostrate, 2 to 5 ft. long ; flowers violet-rosy. In hilly wooded places near Puri-Cacarambóla, not common ; fl. Oct. 1856. No. **6194**.

This is nearly related to *I. fulvicaulis* Boiss.

8. **I. asperifolia** Hall. f., *l.c.*, p. 128.

Huilla.—Leaves purplish beneath ; corolla whitish-purple or rosy. In shortly bushy pastures near Lopollo, rather rare and nowhere abundant ; fl. and fr. Dec. 1859 and Feb. 1860. No. **6126**. A perennial herb ; root woody ; stems numerous, prostrate, subsarmentose ; corolla funnel-shaped, whitish-rosy ; the lobes of the limb marked with a few longitudinal wrinkles ; the tube very bright purple inside. In thickets and sandy pastures about the hippopotamus lake (Ivantalla) ; fl. 6 Jan. 1860. The corolla is about an inch long. Apparently a narrow-leaved form of this species. No. **6129**.

9. **I. cardiosepala** Hochst. in Pl. Kotsch. Nub. nn. 207, 384 (*U. i.* 1841), and ex Choisy in DC. Prodr. ix. p. 429 (1845) ; non Meissn. (1869).

Convolvulus calycinus Roxb. Hort. Beng. p. 13 (1814), and Fl. Ind., edit. Carey, ii. p. 51 (1824). *I. calycina* C. B. Cl. in Hook. Fl. Brit. Ind. iv. p. 201 (1885) ; Hall. f., *l.c.*, p. 129, partly.

Barra do Dande and Loanda.—The two outer sepals cordate-sagittate, the third semi-sagittate, the two inner ones narrowly lanceolate and elongate-acuminate, all herbaceous ; corolla funnel-shaped ; the limb 5-plicate, milk-white-violet in colour on both faces ; the tube deep purple inside ; stamens 5, included, inserted at the base of the corolla-tube, dilated at the base and there densely clothed with hyaline hairs ; ovary 4-celled, rarely by abortion 3-celled ; the cells 1-ovulate ; style simple ; stigmas 2, each consisting of linear-cylindrical papillæ congested and forming a single head ; capsule 4- rarely 2-celled, 4-valved ; seeds 4, erect ; embryo curved ; cotyledons corrugated, green ; radicle thick, inferior, curved, obtuse ; in gravelly places flooded in winter and by reservoirs at the foot of represas, *e.g.*, at Represa do Ricardo in Quicuxe, Forte de Conceição ; fl. Jan. to April 1854. An annual, prostrate herb ; stems whip-like, 5 to 8 ft. long and more, procumbent ; outer sepals hastate, the inner ones semi-hastate, 1 or 2 lanceolate ; corolla white, with the tube purple inside ; the limb flattish, obtusely 5-cleft, with the lobes marked in the middle with impressed lines, two of which converge at the apex of the lobe ; the sinuses obtuse ; in clayey-sandy places by the highway between Camama and Calumba, sparingly ; fl. and fr. 17 June 1858. No. **6238**. A prostrate herb ; branches procumbent far and widely, distantly hispid-pilose ; the three outer sepals sagittate-auriculate, the two inner ones linear-lanceolate ; corolla violet milk-white outside, purple inside especially at the base, twice as long as the calyx, funnel-shaped ; the limb plicate, pointedly 5-lobed ; anthers violet-coloured, large in proportion to the

size of the flower, exceeding the stigma ; the latter bicapitellate, each head consisting of white rather long cylindrical densely clustered papillæ ; in moist depressions near Penedo, Forte Conceição, fl. end of April 1858. Corolla violet-purple, tubular-rotate ; at Bemposta, fr. 18 May 1859. No. **6237**.

Barra do Bengo.—A herb ; root thick ; stems numerous, prostrate ; flowers sordidly violet-purple. In moist places between Quicuxe and Cacuaco ; only one specimen ; fl. Sept. 1858. No. **6236**.

Mossamedes.—An annual, prostrate, herbaceous-green herb, with small purplish flowers. In sandy places at the banks of the river Bero ; fl. and fr. July 1859. No. **6133**.

10. **I. linosepala** Hall. f., *l.c.*, p. 130 (22 Dec. 1893).
I. xiphosepala Baker in Kew Bull. 1894, p. 69 (Feb. 1894).

Pungo Andongo.—A persisting herb, 4 to 8 in. high ; root thick, fusiform, tuberous ; stems numerous, cæspitose, rather erect ; corolla pale rosy outside, deep red inside, funnel-shaped-campanulate ; two of the stamens higher than the rest ; stigma bicapitellate, whitish. In the rocky parts of the gigantic rocks near Catete ; fl. and fr. beginning of Jan. and in Feb. 1857. No. **6191**.

11. **I. chloroneura** Hall. f., *l.c.*, p. 132.

Pungo Andongo.—An annual erect herb ; branches from the base of the stem divaricate, ascending ; flowers (not fully expanded) whitish. In thickets, on volcanic sandstone conglomerate, near Lombe, at the river Cuanza ; fl. March 1857. No. **6181**.

Huilla.—An annual herb, much branched from the base ; stem and branches prostrate, whip-like ; flowers funnel-shaped, whitish or very pale yellowish. In planted grounds and places neglected after cultivation, about Lopollo ; without fl. in Jan. and with fl. and fr. beginning of May 1860. No. **6132**.

12. **I. amœna** Choisy in DC. Prodr. ix. p. 365 (1845) ; Hall. f., *l.c.*, p. 133 ; non Blume.

Ambriz.—At Quizembo ; fl.-bud, Nov. 1853. No. **6197**.

Cazengo.—In rocky thinly bushy places on the left bank of the river Luinha, in the ascent to Mount Muxaulo ; not yet in fl. Dec. 1854. Apparently this species. No. **6198**.

Golungo Alto.—An annual twining herb, remarkable amongst its companions by reason of the peculiar silvery-metallic lustre of its foliage, one of the handsomest plants of the Order and an ornament to the reed-beds where it grows ; calyx 5-parted, densely beset outside with long hairs ; the sepals unequal, the outer one larger than the rest ; corolla funnel-shaped, milk-white, the interior of the tube and throat violet-blood-red ; the lobes of the limb 5, rather obtuse, shortly and broadly ovate, penicillate-pilose at the apex ; stamens 5, inserted at the base of the corolla-tube ; anthers large, cordate-ovoid, attached at the sinuses to the filaments, 2-celled, longitudinally dehiscent ; ovary sessile, ovoid-conical, ending in the filiform style which falls a little short of the stamens, 2-celled, the cells bi-ovulate ; stigma capitate, large, obsoletely bilobed, usually bigibbous-globose. By thickets and in reed-beds in Sobato Mussengue, Bango, etc., not uncommon ; Bango, fl. 29 April 1854 ; on a rather dry sandy-clay soil near Canaulo, by the Ambaca road ; fl. June 1856. No. **6199**.

Pungo Andongo.—No notes. In fl. No. **6200**.

13. **I. elythrocephala** Hall. f., *l.c.*, p. 134.

Golungo Alto.—A perennial, twining herb, sarmentose to a great length ; leaves bright green above, clothed beneath with a snow-white felt ; flowers of a rosy-violet colour, ornamented with white-felted longitudinal folds. Up the stalks of *Penniseta* in reed-beds and at the lower thickets near Trombeta, Camilungo, etc., plentiful; flowering nearly throughout the year ; fl. and fr. March and April 1855. No. **6184**. Flowers purple, with the folds of the corolla cottony and whitish-glaucous. By thickets near N-delle, plentiful ; fl. and fr. Oct. 1855. No **6185**. An annual, widely climbing herb ; leaves discolorous ; flowers 1½ in. long, tubular-campanulate, rosy purple. In a few spots about Canaula, etc. ; fl. June 1856. No. **6183**.

14. **I. Pes tigridis** L. Sp. Pl., edit. 1, p. 162 (1753); Hall. f., *l.c.*

Var. **africana** Hall. f. in Bull. Herb. Boiss. vi. p. 539 (July 1898).

Huilla.—A prostrate herb ; stems several, very long, sarmentose, rooting in every direction, pilose as well as the peltate-digitate leaves ; corolla funnel-shaped, whitish-rosy ; stigma bicapitellate. In fields of maize and *Arachis hypogæa*, about Lopollo, sparingly : fl. 10 Jan. 1860. No. **6119**.

15. **I. involucrata** P. Beauv. Fl. Owar. & Ben. ii. p. 52, t. 89 (1817?); Hall. f. in Engl. Bot. Jahrb. xviii. p. 135.

Golungo Alto.—A perennial, widely climbing herb ; corolla campanulate, purple-red or violet-purple, the folds whitish-glaucous especially towards the base of the tube. In the drier reed-beds throughout Sobato de Bumba, not uncommon ; by thickets near Quibixe, fl. May 1855 ; fl. and fr. July 1855. No. **6188**. At the Quibixe thickets ; fr. Sept. 1855 and June 1856. Coll. Carp. 770.

Huilla.—In fr., without foliage. No notes. Apparently this species. No. **6123**.

Var. *β.* **albiflora** (Welw.).

Corolla campanulate, ⅔ in. long, white.

Golungo Alto.—By the lower thickets near Canaula and Camilungo, fl. April 1856 ; by thickets between Bengo and Sange, fl. end of April 1856. No. **6189**.

16. **I. velutipes** Welw. ex Rendle in Journ. Bot. xxxii. 175 (1894).

Golungo Alto.—A herb, climbing far and widely, remarkable for its densely cottony stem. At the outskirts of the forest near Zengas do Queta ; without either fl. or fr. Dec. 1855. No. **6228**. A perennial, widely climbing herb ; the adult stems clothed with a white cottony coat, the younger ones without cotton ; corolla 1½ in. long, very fugacious, funnel-shaped-campanulate, rosy outside, deep red-purple inside especially from the throat to the bottom of the tube, varnished-shining ; the limb sub-entire, 5-plicate ; stamens 5, 2 of them higher than the rest, included ; filaments springing from the bottom of the corolla-tube, adnate for a considerable length to the tube, then free from it ; anthers rosy ; style filiform, a little shorter than the stamens ; stigma globose-capitate. By damp thickets at the outskirts of the forests among the Queta mountains, not common ; fl. middle of May 1856. No. **6227**. Zengas do Queta ; fl. May and July 1856. No. **6142**. Queta mountains ; fr. August 1856. No. **6226**.

17. **I. pilosa** Sweet, Hort. Brit., edit. 1, ii. p. 289 (1827).

Convolvulus bicolor Desrouss. in Lam. Encycl. Méth. iii. p. 564

(1789); non Vahl. *C. pilosus* Roxb. Hort. Beng. p. 14 (1814), and F. Ind., edit. Carey, ii. p. 55 (1824); non Rottl. *C. dichrous* Roem. & Schultes, Syst. Veg. iv. p. 263 (1819). *I. dichroa* Hochst. in Pl. Schimp. Abyss. ii. n. 820 (*U.i.* 1842), Choisy in DC. Prodr. ix. p. 364 (1845); Hall. f., *l.c.*, p. 136. *I. arachnosperma* Welw. Apontam. p. 588, n. 57 (1859).

Loanda.—An annual climbing lactescent herb of 3 to 6 ft.; leaves bright green above, snow-white or hoary beneath, the middle lobe constantly narrowed at the base; flowers funnel-shaped, rosy, moderate in size; peduncles axillary, 2- to many-flowered; stamens inserted a little above the base of the corolla-tube, included; filaments comparatively elongated, flattened, a little dilated and purple-bearded at the base; anthers large, purple, oblong-obcordate, 2-celled; the cells distant, almost marginal; pollen large, spherical, whitish; ovary conical, to the middle almost immersed in the cupuliform disk, 2-celled; the cells 2-ovulate; style solitary, straight, as long as the filaments, ending in the bilobed stigma; the lobes globose, large, purple; capsule globose, unilocular, 4-valved, 4- or (in a single case) 5-seeded; seeds oblong, obtusely trigonous, sordid-brown, shaggy, scattered above with thin cottony hairs, arachnoid. In dry hilly places by thickets near Maianga do Povo, rather rare; fl. and young fr. end of Feb. 1858. No. **6243**. An annual, climbing herb; leaves lobed, silvery-tomentellous beneath; flowers moderate-sized, rosy; seeds arachnoid. At Maianga do Povo; fr. June 1858. Coll. Carp. 764. In damp thickets near Quicuxe; fr. beginning of Aug. 1858. A more robust form, with the leaf-lobes rather obtuse. No. **6244**.

18. **I. purpurea** Roth, Bot. Abh. p. 27 (1787); Hall. f., *l.c.*, p. 137. *Convolvulus purpureus* L. Sp. Pl., edit. 2, p. 219 (1762). *Pharbitis hispida* Choisy in Mém. Soc. Phys. Genève vi. p. 438 (1834); J. A. Schmidt, Beitr. Fl. Cap. Verd. p. 233 (1852).

Cape Verde Islands.—St. Jago; seeds Jan. 1861. Coll. Carp. 788.

19. **I. Batatas** Poir. Encycl. Méth. vi. p. 14 (1804); Hall. f., *l.c.*, p. 138; Ficalho, Pl. Uteis, p. 226 (1884).

Convolvulus Batatas L. Sp. Pl., edit. 1, p. 154 (1753). *Batatas edulis* Choisy in Mém. Soc. Phys. Genève, vi. p. 435 (1834); Welw. Apontam. p. 551, under n. 98.

Icolo e Bengo.—Rather rarely cultivated at the banks of the rivers Dande and Bengo; very rarely flowering. At Prata, without fl., Sept. 1857. No. **6220**.

Loanda.—A very lactescent herb, root tuberous, whitish-rosy inside; stems prostrate, almost creeping but not rooting, 3 to 8 ft. long, loosely hirsute or shaggy, as well as the hirsute petioles angular, mostly from green to purple; leaves variable in shape, mostly hastate, the basal lobes roundedly angled or bifid with the upper lobules acuminate; peduncles ascending, always longer than the petioles, 5- to 8-flowered, gradually thickened and angular towards the apex; corolla tubular-campanulate, but little revolute, whitish purple outside, deep violet-purple inside except the moderately dilated limb; stigma capitate, whitish, more or less plainly bilobed. Cultivated in arimos (plantations) of some colonists, near Loanda, etc., and only very rarely sub-spontaneous; at Imbondeiro dos Lobos; fl. end of July 1858. The leaves are also eaten by the negroes. No. **6219**.

Golungo Alto.—Cultivated on the right bank of the stream

Delamboa at the foot of Munguella grande; with fl. beginning of Aug. 1856. Native name "Quidingo Cambonge." The leaves are cooked with fungi and greedily eaten by the negroes as a kind of spinach. No. **6173**.

Mossamedes.—Quinquefoliolate. Everywhere cultivated, very plentiful. At Cavalheiros; fl. July 1859. Colonial name "Cará," a name imported from Brazil. No. **6135**. Leaves simple, angled, the angles abruptly acute. Excursion to Costa; fl. July 1859. Cultivated by the Portuguese colonists, but less frequently than the plant with quinquefid-palmate leaves; fl. July; fr. Aug. 1859. No. **6134**.

20. **I. ochracea** G. Don, Gen. Syst. iv. p. 270 (1837); Hall. f., *l.c.*, p. 140. *Convolvulus ochraceus* Lindl. Bot. Reg. t. 1060 (1827). *I. ophthalmantha* Hall. f., *l.c.*, p. 141, partly.

Ambriz.—At Mubanbe on the lake near Quibanga; fl. No. **6174**.

Loanda.—A prostrate herb; root woody, perennial; stems numerous; branches elongated, procumbent, twining at the apex; leaves rather glossy, membranous, deep green; flowers bright, of an orange-sulphur colour with the tube brilliantly violet-purple. In dry places cultivated as well as in uncultivated ones, very plentiful throughout the district, flowering nearly the whole year; between Quicuxe and Alto das Cruzes, April 1854 and Aug. 1858; in sandy plains from Loanda towards Quicuxe, Teba, Imbondeiro dos Lobos, etc., at Quicuxe, 7 Feb. 1859. No. **6245**.

Golungo Alto.—Stem velvety at the base with long white very soft hairs, readily twining; flowers of a deep sulphur colour, expanded from 9 in the forenoon to 3 in the afternoon, closed at other times. Among reeds and tall grasses throughout the district, plentiful; at Menha lula; fl. and fr. July 1855. No. **6176**. By the Ambaca road; fl. and fr. July and Aug. 1856. No. **6175**.

21. **I. humifera** Rendle in Journ. Bot. xxxii. p. 177 (1894).

I. Barteri, var. *cordifolia* Hall. f. in Bull. Herb. Boiss. vi. p. 543 (4 July 1898).

Pungo Andongo.—A herb, apparently perennial, spreading along the ground, not climbing; leaves membranous, rather rigid; flowers purple, tubular, the tube comparatively long. In the wooded thickets of Mata de Pungo; fl. middle of April 1857. No. **6177**. In small forests above Quibinda; in fl.-bud. No. **6178**.

The following No. perhaps belongs here:—

Pungo Andongo.—A delicate herb, growing in the shady forest among low herbs; stem decumbent-twining; flowers very bright white-purpurascent. In rather dense forest near Mutollo near Pedras de Guinga; fl. March 1857. Only one poor specimen. No. **6179**.

22. **I. hellebarda** Schweinf. ms. in Herb. Gallab. (1865) n. 2176, & ex Hall. f. in Engl. Bot. Jahrb. xviii. p. 142.

I. sagittata Benth. in Hook. Niger Fl. p. 467 (1849); Hall. f., *l.c.*; non Poir. (1789).

Var. **sarcopoda** (Welw. ms. in herb).

A perennial herb; rhizome thick, fleshy-woody; stems several, prostrate, slender, cylindrical; branches virgate-twining; leaves subglaucous beneath; peduncles fleshy-thickened from the base upwards, hard, three times thicker than the contiguous stem,

bearing 4- to 8-flowered cymes; corolla funnel-shaped, pale sulphur in colour, purple inside towards the base; stigma capitate.

Loanda.—A widely climbing, handsome plant, with very beautiful flowers. At Represa grande de Quicuxe; fl. April 1858; also in flooded places, about to dry up, near Imbondeiro dos Lobos, rather rare; fl. 8 June 1858. No. **6239**.

23. **I. aquatica** Forsk. Fl. Ægypt.-Arab. p. 44 (1775); Britten, Journ. Bot. xxxii. p. 169 (1894).

Convolvulus reptans L. Sp. Pl., edit. 1, p. 158 (1753). *I. reptans* Poir. ex Roem. & Schultes, Syst. Veg. p. 244 (1819); Hall. f., *l.c.*, p. 143.

Barra do Dande.—A bright green herb, apparently perennial, sometimes creeping far in damp muddy places, in other cases always floating on sufficiently deep water; stems purple, broadly fistulose; leaves sometimes bright green, sometimes more or less glaucescent; flowers campanulate-funnel-shaped, handsome, violet-purple. Near Bombo, plentiful, but only about lakes on both the right and left banks of the river Dande; fl. end of Sept. 1858. No. **6187**.

Pungo Andongo.—In chasms near Sansamanda; fl. No. **6186**. In deep pools between Lombe and Quibinda; fl. March 1857. No. **6171**.

24. **I. stolonifera** Gmelin, Syst. Nat. ii. p. 345 (1791); Britten, Journ. Bot. xxxii. p. 169 (1894).

Convolvulus littoralis L. Syst. Nat., edit. 10, ii. p. 924 (1759). *C. sinuatus* Petagna, Instit. Bot. ii. p. 353, n. 71 (1787). *C. stoloniferus* Cyrill. Pl. Rar. Neapol. i. p. 14, t. 5 (1788). *I. incisa* Br. Prodr. p. 486 (1810). *I. littoralis* Boiss. Fl. Orient. iv. p. 112 (1879); Hall. f., *l.c.*, p. 144. *I. sinuata* O. Kuntze, Rev. Gen. Pl. ii. p. 442 (1891).

Ambriz.—At the shore of the mouth of the river Onço, Mosul; after the fall of the fl., Nov. 1853. No. **6251**.

Libongo.—A herb; root tuberous; stems subterranean, very long, emitting here and there tufts of leaves and a solitary flower above the ground; leaves rather fleshy, glossy; flowers white, turning yellow towards the base and red inside at the bottom. In sandy places, at a distance of 1 to 3 miles from the ocean, by the banks of the river Lifune; fl. end of Nov. 1853. No. **6248**.

Calumbo.—A persisting herb; root tuberous; stems subterranean, sarmentose for a considerable length, whitish, fibrillose, occasionally developing narrow tufts of leaves and white flowers; leaves fleshy, rather rigid, bright green, decidedly glossy above; flowers whitish, purplish inside at the bottom, at length limp and yellowish. In maritime gravelly places between Cape Palmieria and the mouth of the river Cuanza, rather rare; fl. April 1854. No. **6250**. In sandy places near Tanza; without fl. or fr. Feb. 1858. No. **6249**.

25. **I. asarifolia** Roem. & Schult., Syst. Veg. iv. 251; Hall. f., *l.c.*, 145.

Convolvulus asarifolius Desrouss. in Lam. Encycl. Méth. iii. p. 562 (1789).

Golungo Alto.—A decumbent, glaucous-green herb; root tuberous; sarmentose branches 6 to 8 ft. long; leaves fleshy-coriaceous; flowers of a pleasant purple colour, with whitish glaucous folds. On bushy slopes at the river Delamboa, rather rare; fl. April and July 1855 and Aug. 1856. No. **6202**. A herb, with a perennial tuberculate root,

and deep violet-purple almost blood-red flowers. At the Delamboa. No. **6148**. Leaves uniform. At the river Delamboa, Aug. 1856. COLL. CARP. 773.

26. **I. Protea** Rendle & Britten in Journ. Bot. xxxii. p. 176 (1894).

PUNGO ANDONGO.—At Quitage: fl. [10 March 1857]. No. **6192**.

In Engl. Bot. Jahrb. xviii. p. 109 (1893) Dr. H. Hallier suggested the reference of this plant to *Convolvulus canariensis* L.: but he had not seen any flower of it. It is allied to *I. asarifolia* Roem. & Schult.

27. **I. biloba** Forsk. Fl. Ægypt.-Arab. p. 44 (1775).

Convolvulus Pes capræ L. Sp. Pl., edit. 1, p. 159 (1753). *I. Pes Capræ* Roth, Nov. Pl. Sp. 109 (1821); Hall. f., *l.c.*, p. 145.

LOANDA.—A luxuriant plant; the sarmentose branches creeping, more than 50 ft. long, often 66 ft., rarely rooting here and there, and giving off flowering fascicles of leaves; leaves fleshy, rigid, glossy, deep green; flowers purplish. In sandy maritime places, plentiful: at Praia de Zamba grande; fl. and fr. March and April 1858. No. **6240**. Leaves fleshy, rather shining, evergreen; flowers whitish and purple variegated, handsome, occurring nearly the whole year; in gravelly places on the Loanda island near S. Paulo de Loanda; seeds, Feb. 1854. Stolons about 30 to 50 ft. long; in gravelly places at the sea-coast, plentiful and handsome; fr. May 1854. COLL. CARP. 109. At Praia de Zamba grande; fr. May 1858; also at Praia de S. Thiago: fr. Sept. 1858. COLL. CARP. 763.

MOSSAMEDES.—Flowers purple. In gravelly places by the ocean near Mossamedes, not plentiful: fl. July 1859. No. **6125**. On the sandy sea-shore near the city; fr. July 1859. COLL. CARP. 776.

28. **I. Welwitschii** Vatke ex Hall. f., *l.c.*, p. 146.

HUILLA.—Corolla white-rosy. In bushy pastures between Nene and Mumpulla and near Lopollo; fl. Dec. 1859. No. **6120**.

β. **latifolia** Britten, Journ. Bot. xxxii. p. 85 (March 1894).

I. aspericaulis Baker in Kew Bull. 1894, p. 70 (Feb.).

HUILLA.—In fl. and fr. No. **6120***b*.

29. **I. dissecta** Willd. Phytogr. p. 5, t. 2 (1794); non Pursh (1814).

Convolvulus copticus L. Mant. Pl. alt. p. 559 (1771). *I. copticu* Roth, Nov. Pl. Sp. p. 110 (1821); Hall. f., *l.c.*, p. 147. *I. multisecta* Welw. Apontam. p. 589. n. 75 (1859).

LOANDA.—A herb, doubtfully annual or in copiously rainy seasons lasting for several years; stems numerous, prostrate, sarmentose, spreading in a circle, 2 to 5 ft. long; flowers white: on herbaceous hills in moist spots, above Loanda; at Alto das Cruzes: fl. and fr. March 1854. An apparently perennial herb; root rather thick: stems many, branched, whip-like, 2 to 4 ft. long, prostrate in a stellate manner; branchlets ascending; leaves multisect, with linear segments; peduncles axillary, a little longer than the petiole, bearing about 2 or mostly only 1 flower, twice bibracteolate; corolla campanulate, milk-white, ½ in. long, twice as long as the muriculate calyx; in hilly herbaceous places in depressions quite dry in winter but flooded in summer; fl. and fr. May and June 1858. No. **6253**. A low, perennial herb: branches much divided, prostrate in all directions: leaves much cut; flowers white, gamopetalous. At Alto das Cruzes; fr. July 1858. COLL. CARP. 765.

Pungo Andongo.—An annual prostrate herb; corolla tubular-campanulate, white, very fugacious. In sandy moist pastures on the right bank of the river Cuanza, near Sansamanda, 7 Feb. 1857, in company with *Portulaca foliosa* Ker (Welw. no. 1105) and an orchid (cf. Welw. no. 688, *Habenaria?*). No. **6170.**

30. **I. palmata** Forsk. Fl. Ægypt.-Arab. p. 43 (1775); non Kotsch. Exsicc. n. 177.

Convolvulus cairicus L. Syst. Nat., edit. 10, ii. p. 922 (1759). *I. cairica* Sweet, Hort. Brit., ed. 1, pt. ii. 287 (1827); Hall. f., *l.c.*, 148.

Prince's Island.—At the coast, without fl. or fr. Sept. 1853. No. **6208.**

Icolo e Bengo.—In the palm-groves of Santo Antonio by the river Bengo; fl. Dec. 1853. No. **6205.**

Libongo.—A herb, climbing widely and high, with its numerous twining stems embracing chiefly herbaceous bushes of Malvaceæ and *Sesban* (cf. *Abutilon intermedium* Hochst., Welw. no. 4978; and *Sesban sphærocarpus* Welw., Coll. Carp. 388); flowers very prettily violet-purple. In damp bushy places about lakes on the left bank of the river Lifune, plentiful; fl. and fr. Sept. 1858. No. **6206.**

Golungo Alto.—A perennial herb, sometimes twining and climbing, sometimes (in hot situations) prostrate, elongate-sarmentose, quasi-cæspitose; flowers very prettily violet-rosy. By the stems of tall grasses and in sunny thickets, near Sange, not uncommon; fl. and fr. March 1855. No. **6207.**

Mossamedes.—A herb, climbing far and widely, twining, exceedingly pleasing and highly ornamental with its very crowded deep-violet-purple flowers. At rocks by the banks of the river Bero, very plentiful; fl. July and August 1859. No. **6117.**

The following should be compared with this species:—

Golungo Alto.—Creeping on the ground, with 10 to 12 shoots, 7 to 9 in. long; capsule 2-celled, the cells 2-seeded, the seeds hirsute with chestnut-brown hairs. Before Rodrigo's house; fr. April 1856. Coll. Carp. 771. A perennial herb, widely diffuse; sarmentose branches 4 to 8 ft. long, not rooting; flowers violet-purple, handsome; fl. and fr. May 1856. Coll. Carp. 772.

Mossamedes.—Boca do Rio Giraûl; fr. July 1859. Coll. Carp. 775.

31. **I. digitata** L. Syst. Nat., edit. 10, ii. p. 924 (1759).

Convolvulus paniculatus L. Sp. Pl., edit. 1, p. 156 (1753). *I. paniculata* R. Br. Prodr. p. 486 (1810); Hall. f., *l.c.*, p. 149. *Batatas paniculata* Choisy in Mém. Soc. Phys. Genève vi. p. 436 (1834).

Ambriz.—A beautiful, widely climbing, floribund plant, with very pretty rosy-purple flowers. By thickets near the river Quizembo in Sobato Quizembo; fl. Nov. 1853. No. **6241.**

Barra do Bengo.—A tall-climbing herb, with rosy handsome flowers. In the forest at the river Bengo; fl. and fr. Dec. 1853. No. **6242.**

Pungo Andongo.—A climbing, twining plant, almost woody at the base; stem angular; leaves membranous but rather fleshy; corolla campanulate-funnel-shaped, violet purple. By the thickets of Mata de Pungo, sporadic; fl. middle of Dec. 1856. No. **6163.** At Condo; fl. and fr. 1857. No. **6222.**

32. **I. Arenicola** Rendle & Britten in Journ. Bot. xxxii. p. 176.

Pungo Andongo.—A perennial herb, not tuberous; stem decumbent, fleshy, purple; flowers from whitish to violet-coloured, purple

inside. In sandy forests near Cazella; fl. and fr. 18 Oct. 1856. No. **6180**.

33. **I. verbascoidea** Choisy, Convolv. Diss. ii. p. 134 (*Ipomœa*), in Mém. Soc. Phys. Genève viii., pt. 1, p. 56 (1838); Hall. f., *l.c.*, p. 151.

Huilla.—In shrubby places between Mumpulla and Nene. Plant 5 ft. high; in fr. Oct. 1859. No. **6115**. An undershrub, 4 to 5 ft. high, with rosy purple flowers. Varzea do Ferrão da Sola; fl. Dec. 1859. No. **6114**. An undershrub of 3 to 5 ft., with several branches from the base. Hilly thickets near Ferrão da Sola; fl. No. **6111**. In the forest between Mumpulla and Serra da Xella; fr. June 1860. Coll. Carp. 778.

34. **I. prismatosyphon** Welw. Apontam. p. 585, n. 18 (1859); Britten, Journ. Bot. xxxii. p. 84 (1894); Rendle in Journ. Bot. xxxii. p. 215 (*prismatosiphon*).

I. Buchneri Peter in Engl. & Prantl, Nat. Pflanzenfam. iv. 3, p. 29 (1891), *β. tomentosa* Hall. f., *l.c.*, p. 152.

Pungo Andongo.—A perennial, sparingly branched herb, 4 to 6 ft. high, with numerous stems, and very handsome, whitish rosy, spreading flowers. In bushy mountain pastures, in the præsidium, plentiful, in company with *Cissus rubiginosa* Planch. (Welw. herb. no. 1466) and a species of *Siphonanthus*; fl. Feb. and April 1857. No. **6182** At Luxillo, fr. Oct. 1856. Coll. Carp. 786. A lactescent undershrub, standing erect, 4 to 6 ft. high; stems subsimple, as well as the leaves whitish-tomentose; flowers funnel-shaped, whitish rosy, very large and handsome. In thickets near Luxillo; ripe fr. 7 June 1857. Coll. Carp. 161 and 777. A herb, 5 ft. high; stems numerous, leaves white-felted beneath; seeds rigidly pilose. In fr. Coll. Carp. 787.

35. **I. pyramidalis** Hall. f., *l.c.* (Dec. 1893).

I. megalochlamys Baker in Kew Bull. 1894, p. 72 (Feb.).

Huilla.—Perennial: stem decumbent-ascending, 5 to 12 from the same cylindrical and scarcely lactescent rootstock; leaves broadly cordate-ovate, silky-pubescent, secund above; flowers handsome, funnel-shaped, rosy, violet-coloured inside, glossy-purple at the bottom of the tube; filaments dilated at the base, bearded: stigma bicapitellate. In thickets and places neglected after cultivation at Lopollo; fl. 8 May 1860. No. **6113**. An undershrub, 4 to 5 ft. high; rhizome woody-tuberous; stems several, erect, thick, as well as the quasi-verbascoid leaves white-felted; corolla rose-purple, 3½ to 4 in. long, handsome, with a subpentagonal tube. In rocky thickets about the hippopotamus lake (Ivantalla); fl. Feb. 1860. No. **6113***b*.

36. **I. lilacina** Blume, Bijdr. Fl. Ned. Ind. xiii. p. 716 (1825); Hall. f. in Bull. Soc. Bot. Belg. xxxvii. p. 100 (13 Aug. 1898).

I. oxyphylla Baker in Kew Bull. 1894, p. 71.

Pungo Andongo.—Mangue, near Ponte de Mutollo; fl. March 1857. No. **6229**.

37. **I. nuda** Baker in Kew Bull. 1894, p. 72; non Peter.

Pungo Andongo.—Herbaceous, very widely climbing, leaves entire, cordate; flowers very crowded; calyx pentaphyllous or nearly so: corolla violet-purple; stigma distinctly bicapitellate. In bushy places near Catete in the præsidium: fl. 26 May 1857. No. **6230**.

I. nuda Peter in Engl. & Prantl, Nat. Pflanzenfam. iv. 3a, p. 31 (1891), a Guatemala species, has been reduced by Hallier to *Operculina tuberosa* Meissn.

The following No. is apparently an undescribed species of *Ipomœa*, related to *I. convolvuloides* Schinz in Verh. Bot. Brandenb. xxx. p. 273 (1888), non Hallier f. (1893) :—

Huilla.—Root tuberous, hard, nearly turnip-shaped, of the size of a very large fist : stem arising from the centre of the tuber, erect, virgate, a foot high (in the only specimen seen), leafy, more or less reddish ; leaves narrowly lanceolate-linear, shortly petiolate, obtusely keeled beneath with the thick semi-cylindrical midrib, rather fleshy, about $1\frac{1}{4}$ in. long (inclusive) ; flowers axillary, erect, solitary, shortly pedunculate, about $\frac{3}{4}$ in. long, borne on a fleshy thick peduncle, with two opposite lanceolate erect bracteoles at the base, white-purplish ; calyx-segments 5, broadly lanceolate, abruptly subulate at the apex, adpressed to the corolla and including it beyond the middle, about $\frac{1}{2}$ in. long ; corolla-limb erect, strongly plicate ; stamens 5, included ; filaments at the base curved-ascending ; anthers oblong-linear, sagittate at the base, white as is also the pollen ; stigma whitish, obtusely capitate, simple. In bushy hilly places and in fields, near Lopollo ; the tuber collected in April 1860, planted in the Lumiar garden near Lisbon and fl. May 1862. Only the flowers and leaves (in the study set). No. **6124**.

12. **CALONYCTION** Choisy in Mém. Soc. Phys. Genève, vi. p. 441 (1834) ; Hall. f. in Engl. Bot. Jahrb. xvi. p. 583 (1893).

Ipomœa Benth. & Hook. f. Gen. Pl. ii. p. 870, partly.

1. **C. speciosum** Choisy, *l.c.*

Ipomœa bona nox L. Sp. Pl., edit. 2, p. 228 (1762). *C. bona nox* Boj. Hort. Maurit. p. 227 (1837) ; Hall. f. in Bull. Herb. Boiss. v. p. 1028 (1897).

Golungo Alto.—By thickets and at the outskirts of the forest near N-delle, rather rare ; fl. and fr. end of July 1855. No. **6147**. Cultivated in Lisbon from seeds sent in 1858 from Golungo Alto. No. **6147***b*. At Undelle ; ripe fr. June 1856 and July 1857. Coll. Carp. 779.

2. **C. muricatum** G. Don, Gen. Syst. iv. p. 264 (1838) ; Welw. Apontam. p. 584, n. 11 ; Hall. f. *l.c.*, p. 1044 & in Engl. Bot. Jahrb. xviii. p. 154.

C. speciosum, var. b., Choisy, *l.c.* *Convolvulus muricatus* L. Mant. Pl. i. p. 44 (1767).

Pungo Andongo.—A perennial herb, climbing high and far, a striking ornament to all the thickets of the præsidium in the rainy season of March and April ; flowers either quite white or pale violet-coloured outside and deep violet-purple inside, very sweetly fragrant. By thickets ; fl. April 1857 ; and at Welwitsch's house in Pungo Andongo, fl. May 1857. No. **6146**.

13. **QUAMOCLIT** Tournef. ex Moench, Meth. Pl. p. 453 & index (1794) ; Hallier f. in Engl. Bot. Jahrb. xvi. p. 584 (1893).

Ipomœa Benth. & Hook. f. Gen. Pl. ii. p. 870, partly.

1. **Q. coccinea** Moench, *l.c.* ; Hall. f., *l.c.*, xviii. p. 154 (1893).

Ipomœa coccinea L. Sp. Pl., edit. 1, p. 160 (1753).

Loanda.—A twining, annual herb, with funnel-shaped purple flowers. Probably introduced; fl. and fr. 20 May 1858. No. **6234**.

Island of St. Thomas.—At the bushy margins of fields; fl.-bud Dec. 1860. Perhaps this species. No. **6212**.

2. **Q. vulgaris** Choisy in Mém. Soc. Phys. Genève, vi. p. 434 (1834).

Ipomœa Quamoclit L. Sp. Pl., edit. 1, p. 159 (1753). *Q. pinnata* Bojer, Hort. Maurit. p. 224 (1837); Hall. f., *l.c.* *Ipomœa* sp., Welw. Apontam. p. 551 sub n. 98.

Prince's Island.—By thickets near Baixa de Santo Antonio, wild but not indigenous; fl. Sept. 1853. No. **6209**.

This handsome species is cultivated in some Loanda gardens.

14. **STICTOCARDIA** Hall. f. in Engl. Bot. Jahrb. xviii. p. 159 (22 Dec. 1893); Peter in Engl. Nat. Pflanzenfam. iv. 3*a*, p. 376 (1897).

Argyreia Benth. & Hook. f. Gen. Pl. ii. p. 869, partly.

1. **S. tiliæfolia** Hall. f., *l.c.*

Convolvulus tiliæfolius Desrouss. in Lam. Encycl. Méth. iii. p. 544 (1789). *Rivea tiliæfolia* Choisy in Mém. Soc. Phys. Genèv. vi. p. 407 (1834); J. A. Schmidt, Beitr. Fl. Cap. Verd. Ins. p. 234 (1852).

Cape de Verde Islands.—Petals rosy violet in colour, very fugacious. In bushy places on Monte Verde, on the island of St. Vincent, at an elevation of 800 to 1000 ft.; fl. end of Aug. 1853. No. **6213**.

15. **CUSCUTA** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. p. 881.

1. **C. planiflora** Tenore, Fl. Nap. iii. p. 250 (1824-9); Engelm. in Trans. Acad. Sc. St. Louis, i. p. 464 (1859).

Cuscuta (sp.), Welw. in Journ. Linn. Soc. v. p. 185 (1861).

Var. (?) **mossamedensis** (Welw. ms. in herb.).

A slender, twining, leafless, glabrous or minutely glandular-puberulous herb; stems filiform, smooth, purple-bloodred or even orange-coloured at the nodes, very intricately twisted, flexible, rather tenacious, floribund; flowers globose-urceolate, closely clustered, about $\frac{1}{16}$ to $\frac{1}{12}$ in. in diameter, sessile or subsessile; the clusters globose, $\frac{1}{6}$ to $\frac{1}{4}$ in. in diameter; calyx green-reddish, 4-lobed; the segments broadly ovate, obtuse or apiculate; corolla white, thinly scarious-membranous, scarcely as long as the calyx, 4-cleft; the lobes triangular, acute, rather spreading; stamens 4, inserted on the corolla-tube near the top, scarcely included; anthers yellow, 2-celled, dehiscing longitudinally; ovary obovoid-globose, turgid, 2-celled, 4-ovulate; style bipartite; stigmas linear, about as long as the ovary; capsule circumsciss at the base, imperfectly 2-celled; seeds usually 4, $\frac{1}{20}$ in. long, obovoid, chestnut-brown or yellowish dusky, erect.

Mossamedes.—Parasitic on *Merremia multisecta* Hallier f. (Welw. herb. no. 6112), between Cazimba and Mossamedes by the road to Cabo Negro, in gravelly sub-maritime stations flooded in the rainy season, sometimes more than a mile from the ocean, plentiful but seen nowhere else; fl. and fr. 4 Sept. 1859. No. **6141** and Coll. Carp. 112.

2. **C. blepharolepis** Welw. ms. in herb.

A herb, fleshy throughout, brittle, of a deep orange or saffron colour; stems cylindrical, smooth; flowers sessile or subsessile,

about $\frac{1}{12}$ in. in diameter, several or many together in lateral distant or approximated clusters of about $\frac{1}{4}$ in. in diameter which often have an ovate-rotundate bract $\frac{1}{12}$ in. long at the base; calyx and corolla 5-cleft, pale yellowish; calyx hemispherical, its lobes broadly ovate, obtuse; corolla rather smaller than the calyx, the lobes narrower and apiculate; scales oblong, relatively large, deeply fringed on the margin subjacent to the stamens, embracing the styles and in this way closing the corolla-throat; anthers yellow; connective produced at the apex; ovary 2-celled, seated on a thick waxy saffron-coloured disk, the cells 2-ovulate; styles 2, straight, exserted together with the stamens; stigmas disciform-capitate; seeds $\frac{1}{40}$ to $\frac{1}{30}$ in. long.

Pungo Andongo.—In the more elevated wooded bushy parts of Pedra de Cabondo, infesting shrubs and neighbouring herbs, such as *Cissus*, *Paullinia*, and Urticaceæ, with a very dense saffron-coloured network; fl. and fr. beginning of Dec. 1856 and April 1857. No. **6140**.

The following No. appears to belong to the family, and possibly is *Aniseia martinicensis* Choisy:—

Huilla.—Root-tuber solid, large, turnip-shaped, sending up several prostrate elongated sarmentose stems; leaves alternate, distant, obovate-lanceolate, deep green, thinly fleshy. The tuber was obtained near Lopollo, and the leafy shoot was grown in the Lumiar garden near Lisbon. No. **6750**.

LXXXVIII. SOLANACEÆ.

In the highlands of Huilla, where manioc does not succeed, the common potato was introduced in 1840, and is extensively cultivated by the negroes of Munhaneca in Humpata; in Welwitsch's time the potato disease had not appeared there. After a prolonged diet of potatoes in Humpata, the Monanos, who were quite unaccustomed to them, suffered from an outbreak of dysentery.

The Daturas appear to have immigrated from Asia; they, as well as hemp, have the Bunda name "Sambalage," derived from *dilage*, which means madness; their poisonous narcotic properties have been known to the negroes from the earliest times. Welwitsch was convinced in several instances that the seeds were intentionally used to produce poisoning, which in each case was attributed to other poisonous plants known only to the negroes. The drugging of palm wine with Datura, which is supposed to be caused by the so-called "Fel de Jacari," supplies an emphatic proof.

1. **LYCOPERSICON** Tournef. ex Miller (1759); Benth. & Hook. f. Gen. Pl. ii. p. 888 (*Lycopersicum*).

1. **L. esculentum** Mill. Gard. Dict., edit. 8, n. 2 (1768); Welw. Apontam. p. 551 sub n. 100 (1859).

Solanum Lycopersicum L. Sp. Pl., edit. 1, p. 185 (1753). *S. cerasiforme* Dunal, Hist. Solan. p. 113 (1813).

Barra do Bengo, Loanda, etc.—An annual prostrate herb; branchlets ascending; flowers yellow; fruit globose, as big as a very large cherry, glossy, of an orange-cinnabar colour, soft when ripe, quickly rotting. Perfectly spherical fruits and other fruits ribbed-sulcate and a little larger were frequently seen by Welwitsch to occur on the same individual plants. Wild but not indigenous, very plentifully occurring in all neglected formerly cultivated places and about dwellings, also at the stations (called Quilombo) of the migratory negroes, from the Atlantic shore to Condo; in fields between Quicuxe and Cacuaco; fl. and fr. beginning of Aug. 1858. No. **6046**.

This plant is especially frequent about the fundas (caravan encampments) in company with *Cleome* and *Psidium*. There is a rapid transition from the large-sized berries to those no bigger than cherries, with several instead of only two cells.

2. **SOLANUM** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. 888.

1. **S. nigrum** L. Sp. Pl., edit. 1, p. 186 (1753), partly.

Golungo Alto.—Stems ascending. Varzea grande of the Coango; fl. and young fr. June 1856. No. **6099**. Stem at the base ascending, cylindrical, glossy, nodose at the ramification, angular above; flowers white; anthers yellow; berries black. Among plants of manioc and beans in the varzea of Isidoro at the river Coango; fl. and fr. July 1855. No. **6100**. An annual herb, sometimes ascending, sometimes erect; stem angular; flowers mostly 5-cleft but not rarely 4-cleft, white; anthers yellow; berries black. In plots planted with beans and maize, near Sange, sporadic; fl. and fr. beginning of Aug. 1855. No. **6101**. In fl. June 1857. Only one specimen. No. **6101***b*.

Var. **villosum** L., *l.c.*

Pungo Andongo.—An annual, ascending herb; stem angular: flowers white, small; berries black. In damp and also in dry fields and in uncultivated places, tolerably plentiful near Cabondo; also in localities far removed from dwellings; fl. and fr. April 1857. No. **6109**.

Mossamedes.—An annual herb, ½ to 2 ft. high. In damp sandy places at the banks of the river Bero, near Mossamedes; fl. and fr. July 1859. No. **6036***b*.

Huilla.—Leaves coarsely toothed. In bushy places at cataracts near Lopollo; fl. 11 Jan. 1860. No. **6036**. An annual, erect herb, 2 to 3 ft. high; flowers white. In moist places by fields near Lopollo, Embala; fl. 8 Nov. 1859. No. **6035**.

Var. **guineensis** L., *l.c.*

Golungo Alto.—Varzea near Camilungo; fl. and young fr. May 1855. No. **6102**.

2. **S. suffruticosum** Schousboe ex Willd. Enum. Hort. Berol. p. 236 (1809).

Icolo e Bengo.—In palm-groves at the river Bengo; fl. and fr. Dec. 1853. No. **6053**.

Perhaps only a shrubby variety of *S. nigrum*.

3. **S. nodiflorum** Jacq. Ic. Pl. Rar. ii. p. 11, t. 326 (1786-1793). *S. tinctorium* Welw. Apontam. pp. 551, 590, n. 95 (1859), and Synopse Explic. p. 29, n. 70 (1862); Ficalho, Pl. Uteis, p. 232 (1884).

Golungo Alto.—An annual or biennial, decumbent herb, 2 to 3 ft. high, with the aspect of *S. nigrum* but with smaller flowers and in

other respects more robust ; stem thick, marked with two acute wings by the decurrent base of the leaves, branched ; leaves broadly ovate ; flowers small, white ; berries globose, black, or when ripe atro-purpureous, in size like a very large pea or the grape called in Portugal Bastardo, valued for their deep purple juice, which the negroes use as an ink (and with which Welwitsch wrote his notes relating to the specimens). In places neglected after cultivation and about negro villages in Sobatos Baugo, Quilombo, etc., not uncommon ; fl. and fr. end of Jan. 1855, in July and middle of Aug. 1856, and in June 1857. No. **6103** and Coll. Carp. 138, 789, 790, 791.

Pungo Andongo.—A slender, erect, annual herb, in habit more or less like *S. nigrum* ; flowers white ; fruit from black to atropurpureous. In manioc plantations near Luxillo ; fl. and fr. Jan. 1857. A slender form of the species. No. **6108**.

Mossamedes.—At Cavalheiros ; fl. July 1859. "Herba Moira." No. **6033**.

Huilla.—In moist herbaceous places by the banks of the Lopollo river ; fl. Dec. 1859. No. **6034**.

In Golungo Alto this herb is called by the natives "Disûe." Welwitsch stated that the writing on some documents in the government office there, after having been written with the purple ink of the berries upwards of forty years, preserved their original colour. Perhaps only a variety of *S. nigrum*, the Portuguese name of which is "herva moira."

4. **S. Thonningianum** Jacq. f. Eclog. i. p. 123, t. 83 (1816); Ficalho, Pl. Uteis, p. 232 (1884).

S. Atropo Schum. & Thonn. in Dansk. Vid. Selsk. iii. 144 (1828).

Loanda.—A herb, 3 or rarely 4 ft. high, nearly glabrous throughout, divaricately branched ; stem and leaf-nerves atropurpureous ; flowers large, of a deep violet colour ; berries good to eat, depresso-globose, hollowed at the apex, like a tangerine orange in shape and colour. In places neglected after cultivation, between Loanda and Camama ; at Bemposta in company with *Marsilea* ; fl. 18 May 1859. Negro name "Mamote." No. **6076**.

5. **S. pauperum** Wright in Kew Bull. 1894, p. 127.

Loanda.—A shrublet, 3 ft. high, branched from the base ; branches spreading ; leaves membranous, deep green ; flowers from whitish to pomegranate-purple, berries brick-red. In thickets near Imbondeiro dos Lobos, here and there ; fl. and young fr. June 1858 ; at Alto das Cruzes and near Museque de L. Gomez ; fl. Feb. 1854. No. **6054**. No notes. Nos. **6074** and **6075**. An evergreen shrub ; leaves green, more or less oblong ; flowers clear blue ; berries scarlet. By thickets, sporadic ; fr. beginning of March 1854. Apparently this species. Coll. Carp. 796.

6. **S. bifurcum** Hochst. in Schimp. Pl. Abyss. i. n. 201 (*U. i.* 1840) ; A. Rich. Fl. Abyss. ii. p. 98 (1851) (*bifurcatum*) ; Dunal in DC. Prodr. xiii. 1, p. 77 (1852).

Pungo Andongo.—Mata de Cabondo ; fl. Feb. 1857. No. **6107**. A shrub, climbing to a great height ; flower clear blue ; berries brick-red. In the dense primitive forests of Pungo ; fl. and fr. April 1857. No. **6106**.

The following No., which is represented in the British Museum by a fragmentary specimen, should be compared with this species ; in the study set the inflorescence is leaf-opposed, cymose, pedunculate, and rather slender :—

Bumbo.—Flowers deep lilac. Climbing; in Serra da Chella; fl. Oct. 1859. No. **6032**.

7. **S. Welwitschii** Wright in Kew Bull. 1894, p. 126.
S. pendulum Welw. ms. ex Wright, *l.c.*, not of others.

Cazengo.—A shrub, 6 to 10 ft. high, divaricately branched; sarmentose branches long, climbing; leaves fleshy-coriaceous, brittle; flowering and fruiting branchlets very crowded, pendulous; flowers of a deep violet colour, almost like those of *S. Dulcamara*; corolla-lobes during the flowering reflected-spreading; anthers closely connivent from the base to the apex, deep orange-yellow, dehiscing by two large apical pores. In the most elevated forests of the Muxaulo mountains, sparingly; fl. beginning of June 1855. (Also in Mata de Quisuculo in Golungo Alto; fr. Sept. 1855; cf. no. 6098.) No. **6081**.
Golungo Alto.—No notes. In fr. No. **6098**.

8. **S. delagoense** Dunal in DC. Prodr. xiii. 1, p. 349 (1852).

Loanda.—A herb, 2 to 3 ft. high, patently branched above, rarely somewhat shrubby at the base: flowers large, of a pretty violet colour; berries deep sulphur-yellow, like a very large cherry in size. In dry hilly places about the city of Loanda; fl. and fr. May and June 1858. No. **6049**. No notes. An unarmed plant in fl. and fr., perhaps belonging here. No. **6078**.
Huilla.—Sometimes very prickly, sometimes almost unarmed; flowers violet-coloured. In bushy pastures between Nene and Mumpulla; fl. Oct. 1859. Apparently this species. No. **6031**.

9. **S. albifolium** Wright in Kew Bull. 1894, p. 127.
S. saponaceum Welw. Apontam. p. 551 and p. 588 n. 60 (1859); Ficalho, Pl. Uteis, p. 232 (1884); non Dunal.

Golungo Alto.—A small tree of 5 to 8 ft., with the trunk bare below and divaricately branched above, or usually a shrub of 4 to 5 ft.; flowers white or whitish-violet; fruit edible. By secondary thickets near Quibixe; fl. Dec. 1854. No. **6095**. Fl. and fr. No. **6095***b*. A shrub as tall as a man, smooth or spiny; leaves pinnatifid-lobed, white-tomentose beneath. At Sange; seeds, March 1855. Coll. Carp. 792.
Pungo Andongo.—A tortuously branched, little tree, 6 to 10 ft. high, or usually a shrub of 4 to 5 ft.; leaves discolorous; fruit sulphur-coloured, shining, as large as a pigeon's egg. In sunny bushy places near Candumba; fl. and fr. March 1857. Coll. Carp. 793. The spiny variety; seeds. Coll. Carp. 794. An arborescent shrub. At Condo; seeds, March 1857. Probably this species. Coll. Carp. 801.
In Golungo Alto the native name is "Dondôlo" or "Jindondôlo"; it ranges from 4 to 12 ft. in height, and the seeds are used by the negroes for washing clothes; it is on that account also called Ambaca soap, for in that district it is in very frequent use. There is a variety with spines, and another without.
Bumbo.—A shrub, 5 to 6 ft. high; trunk straight, with rambling branches at the apex. In sunny parts of Serra da Xella; without fl. or fr. Oct. 1859. This determination is doubtful: the foliage much resembles that of *S. aculeastrum* Dunal. No. **6040**.

10. **S. Naumanni** Engl. Bot. Jahrb. viii. p. 64 (1886).

Loanda ?—No notes. With no. 6077. In fl and fr. No. **6077***b*. The fruit is $\frac{2}{5}$ to $\frac{3}{5}$ in. in diameter.

11. **S. catombelense** Peyritsch in Sitz. Akad. Math.-Nat. Wien xxxviii. p. 576 (1860).

S. albotomentosum Wright in Kew Bull. 1894 p. 128.

Loanda.—An undershrub, divaricately branched, 2 to 2½ ft. high, mostly erect; stem sometimes prickly, sometimes unarmed; leaves polymorphous; flowers small, from milk-white to lilac; berries scarlet. In rather dry bushy and rocky places; near Maianga do Povo, fl. and fr. Feb. 1858; about Alto das Cruzes, fl. June 1858. No. **6048**. At Praia de Conceição; fl. and fr. Feb. 1858. No. **6077**. Silky-tomentose on the stem branches and foliage; branches patently divaricate, bent in a zigzag manner; leaves ovate-lanceolate, repand; flowers moderate in size; corolla violet in colour; anthers orange; berries orange-scarlet, pea-sized. Not uncommon in rocky places especially maritime, at Praia de Bispa and near Maianga del Rei; fl. and fr. July 1858. No. **6050**. No notes. Fl. and fr. No. **6050***b*. Shrubby; leaves glaucous-tomentose; flowers small, sparse; berries crowded, cinnabar-red, chartaceous and dry when ripe. At rocks close by the ocean near Samba; fr. Dec. 1853. Coll. Carp. 795. A pubescent-hoary undershrub; flowers violet in colour; berries deep cinnabar-red, dry. At Praia da Zamba grande; fr. Feb. 1858. Coll. Carp. 798.

Mossamedes.—A divaricately branched shrublet, 2 ft. high; stem prickly; flowers violet-coloured; berries at first sulphur-coloured, soon turning orange-scarlet, as big as a pea. In bushy sandy places at the river Bero; fl. and fr. end of June 1859. No. **6041**.

Dr. Karl von Keissler, of Vienna, at my request has kindly compared a specimen of No. 6048 with the type of Peyritsch's species, Wawra, n. 268, and certifies their identity; it is probably not distinct from *S. Naumanni* Engl.; the berries range from ¼ to ⅜ in. in diameter.

The following possibly belongs here:—

Loanda.—An evergreen shrub, 3 to 4 ft. high; leaves tomentose; flowers handsome, deep violet in colour. At Maianga del Rei; seeds, July 1854. Coll. Carp, 797.

12. **S. coagulans** Forsk. Fl. Ægypt.-Arab. p. 47 (1775).

Benguella.—In fl. June 1859. No. **6039***b*.

Mossamedes.—Shrubby, 3 ft. high, always more or less leafy, yellowish-hoary, divaricately branched; flowers large, deep violet in colour; berries yellow, spherical, as large as a walnut. In sandy bushy places at the banks of the river Bero; fl. and fr. July 1859. No. **6039**.

13. **S. Melongena** L. Sp. Pl. edit 1, p. 186 (1753); Welw. Apontam. p. 551 sub n. 100 (1859).

S. esculentum Dunal, Hist. Solan. p. 208, t. 3E (1813) and in DC. Prodr. xiii. 1 p. 355 (1852). *S. edule* Schum. & Thonn. in Dansk. Vidensk. Selsk. iii. p. 145 (1828); Ficalho, Pl. Uteis, p. 231.

Ambaca.—Shrubby, 3 to 4 ft. high, hoary-tomentose throughout; flowers whitish. In dry fields near Pemba and in hilly places near the river Lucala, not uncommon; fl. middle of Oct. 1856. No. **6083**. An erect suffrutescent herb, divaricately branched towards the apex; flowers whitish. In a spot neglected after cultivation near N-gombe, very rare; fl. Oct. 1856. No. **6084**.

Var. **inerme** (Dunal in DC., *l.c.*).

Golungo Alto.—Fruit yellow, pendulous. In the drier secondary thickets near Sange; fl. and fr. No. **6091**. In secondary thickets on

the left bank of the river Cuango ; fl. and fr. May 1855. No. 6092. A stout undersbrub, 4 or rarely 5 ft. high, unarmed, with irregularly divaricate branches ; flowers whitish ; calyx usually 6- or 7-cleft ; berry depresso-globose, deeply furrowed, orange-scarlet, edible, even the unripe fruit being greedily consumed by the negroes, the ribs obtuse and unequal like those in *Lycopersicon*. Wild here and there about the village and deserted dwellings, and cultivated ; at an abandoned sensala (native village) on the bank of the river Luinha in Queta : fl. and fr. July 1856. Native name "N-gilla." No. 6093. A diffusely branched shrub or undershrub, 2 to 3 ft. high ; flowers white ; fruit as large as a small pigeon's egg, at first ivory-coloured, afterwards turning yellow, edible. About Banza do Sobato Bango ; fl. and fr. 7 Sept. 1855. No. 6094.

14. **S. scalare** Wright in Journ. Linn. Soc. xxx. p. 93 (1894).

Golungo Alto.—Flowers violet in colour ; berries reddening. In rough places on rubbish heaps and by roadsides near Sange ; fr. No. 6088. A patently branched berb, 3 to 4 ft. high, whitish-lepidote throughout ; flowers white, occasionally a little purplish ; berries scarlet, as big as peas. In rather dry bushy places near Camilungo, etc., frequent but always solitary ; fl. Feb. 1856. No. 6089. No notes. In fl. and fr. No. 6089*b*. A herb, 2½ to 3½ or rarely 4 ft. high : stem straight, patently branched ; flowers whitish ; berries cinnabar-red. In somewhat shady parts of palm groves on the left bank of the river Quibolo ; fl. and fr. March and July 1856. No. 6090. A shrub, 3 to 4 ft. high ; leaves tomentose ; flowers white ; fruit orange-red. In sunny places near Aldea do Golungo Alto ; fr. Sept. Apparently this species. Coll. Carp. 799.

Pungo Andongo.—A branched undershrub, 4 ft. high ; stems and flowers violaceous-purpurascent ; berries scarlet. In thickets to the south of the præsidium at the banks of the river Casabalé ; fl. and fr. Jan. 1857. No. 6104.

15. **S. insigne** Lowe in Journ. Hort. Soc., n.s. i. p. 178 (1867).

Mossamedes.—A small tree, 5 to 7 ft. high, with a broad head : branches erect ; branchlets spreading ; leaves rather fleshy, dull green ; flowers from whitish to purplish ; berries ellipsoidal, orange-cinnabar in colour. Cultivated in gardens at Mossamedes, which was said to have recently been introduced from Oporto ; fl. and fr. June 1859. No. 6037.

In the study set the inflorescence is 3 in. long and pedunculate, and the berry is fusiform, 2 in. long, shining, and glabrous.

16. **S. Mannii** Wright in Kew Bull. 1894, p. 129.

Var. **compactum** Wright, *l.c.*

Ambriz.—Hills near Ambriz ; fl. and fr. Nov. 1853. No. 6079.

Libongo.—An annual erect herb, nearly simple, 7 in. high, with the habit of *S. nigrum*. In sandy places at the river Lifune near Banza de Libongo, in company with *Physalis* ; fl. and young fr. Sept. 1858. No. 6080.

Barra do Dande.—A strongly branched shrub, 4 to 6 ft. high ; branches tomentose, prickly ; flowers white : berries cinnabar-red. In gravelly places at the mouth of the river Dande ; fl. and fr. Nov. 1853. No. 6052.

Zenza do Golungo.—In dry bushy places near Calumguembo ; fragmentary, apparently of this species ; fl. and fr. Sept. 1854. No. 6087.

Ambaca.—An erect undershrub, woody at the base, 3 to 4 ft.

high ; leaves membranous but rather fleshy ; flowers from whitish to lilac ; anthers yellow ; berries at first yellowish, at length turning black. On bushy hills near Puri-Cacarambola, sparingly ; fl. and fr. middle of Oct. 1856. No. **6082.**

Pungo Andongo.—An undershrub, 3 ft. high ; flowers white ; berries cinnabar-red, scarcely as big as peas. In bushy pastures in the præsidium and at Pedra Cabondo ; fl. and young fr. end of Nov. 1856. No. **6105.**

17. **S. indicum** L. Sp. Pl., edit. i., p. 187 (1753), partly.

Huilla.—A strongly branched and prickly shrub, 3 to 5 ft. high ; flowers violet in colour ; berries scarlet. Usually growing in dense masses on the sites of previous negro-huts, flowering nearly throughout the year ; at Embala de Lopollo ; fl. and fr. Dec. 1859 and April 1860. No. **6038.** A shrublet, 3 to 4 ft. high ; leaves sinuate ; berries cinnabar-red, pea-shaped. May 1860. Determination doubtful. Coll. Carp. 81.

18. **S. duplosinuatum** Kl. in Peters, Mossamb. Bot. p. 233 (1861).

Golungo Alto.—An undershrub or rarely a shrub, 2 to 3½ ft. high, sometimes almost unarmed, sometimes bristling with white-yellowish prickles ; corolla deep violet in colour, usually 5- but not rarely 6-cleft. In rather dry sunny places at the outskirts of thickets throughout the district, plentiful ; at Sange, fl. beginning of Aug. 1855. No. **6096.** A much branched, very prickly undershrub ; flowers large, violet in colour ; berries deep yellow, as large as a pigeon's egg. In rough sunny places near Sange ; seeds July 1857. Apparently this species. Coll. Carp. 800.

Prince's Island. In fr. Sept. 1853. A poor specimen, apparently of this species. No. **6085.**

19. **S. fuscatum** L. Sp. Pl., edit. 2, i. p. 268 (1762).

Cape de Verde Islands.—At Villa da Praia in the island of San Thiago ; fl. Jan. 1861. No. **6086.**

3. **PHYSALIS** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 890.

1. **P. minima** L. Sp. Pl., edit. 1, p. 183 (1753); Dunal in DC. Prodr. xiii. 1, p. 445 (1852).

P. divaricata D. Don, Prodr. p. 97 (1825); Dunal, *l.c.*, p. 444.

Libongo.—An annual, erect herb, branched from the base ; flowers from whitish to yellowish ; fruit pale yellow, in size (without the calyx) like a very large pea, eaten by the negroes and found by Welwitsch not altogether unpleasant. In damp sandy places at the banks of the river Lifune, near Banza de Libongo ; fl. and fr. Sept. 1858. Negro name "Cabôboád." No. **6055.**

Golungo Alto.—Stem angular, 2 to 3 ft. high ; ripening calyx acutely angular, the keels of the angles somewhat crenate and beset with long hyaline hairs ; corolla pale sulphur in colour, small. In the rather shady parts of thickets, also at roadside ; road towards Capopa ; fl. and young fr. 1 Dec. 1854. No. **6057.** A prostrate herb, with a mouse-like smell throughout ; stems divaricately branched, densely shaggy ; flowers yellowish. In places neglected after cultivation, on a moist sandy soil, in company with species of *Cyperus*, etc., in Sobato Cabanga-Cacalungo ; fl. and fr. beginning of Feb. 1855. No. **6058.** In like situations at the base of the Cungulungulo mountains ; fl. and fr. Feb. 1855. No. **6059.** Stem at first erect, afterwards weakened by the rapid development of the lower branches ; the basal

branches greatly elongated, decumbent; corolla sulphur-yellow, atropurpureous towards the base both inside and out. In cultivated and sunny sandy places, not everywhere; at Varzea do Isidro near Sange; fl. and fr. July 1855. No. **6056**.

Mossamedes.—Berries eaten. In damp fields, especially in plantations of cotton and sugar, often too abundant; fl. and fr. July 1859. No. **6026**.

The leaves are generally eaten by the negroes. It occurred plentifully at the lake of Quilunda, near Prata, in the district of Icolo e Bengo; fl. and fr. Sept. 1854.

4. **CAPSICUM** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. p. 892.

1. **C. annuum** L. Sp. Pl., edit. 1, p. 188 (1753); Fingerh. Mon. Caps. p. 12, t. 2 (1832).

Loanda.—In the city; probably cultivated; fr. Nov. 1860. Apparently this species or possibly *C. longum* DC. Coll. Carp. 803.

2. **C. frutescens** L., *l.c.*, p. 189; Fingerh., *l.c.*, p. 17, t. 4, fig. c.

Ambriz.—Cultivated and wild; fr. Apparently this species or perhaps *C. conoides* Mill., which some authors regard as synonymous. No. **6066**.

3. **C. baccatum** L. Mant. Pl. i. p. 47 (1767); Fingerh., *l.c.*, p. 18, t. 4, fig. a.

C. comarim Velloz. Fl. Flumin. p. 60 (1825)?; Welw. in Bol. Conselho Ultramar. Lisb. No. 7, p. 83, n. 68 (Aug. 1854).

Ambriz.—Cultivated near Mubango and Quibanza; fl. and fr. end of Nov. 1853. Negro name "Comorim." No. **6068**, and Coll. Carp. 802.

Golungo Alto.—Ripe berries more or less ellipsoidal, scarlet, not eaten by the negroes. In the forests of nearly all the Sobatos, but sporadic, very remote from human habitations and even in the densest forests, apparently indigenous; in Mata de Quibanga; fl. and fr. Dec. 1855. No. **6071**. Not uncommon in the primitive forest of Mata de Quibanga; fl. and fr. Jan. 1856. No. **6064**.

4. **C. cerasiforme** Miller, Gard. Dict., edit. 8, n. 5 (1768).

C. Milleri Roem. & Schult. Syst. Veg. iv. p. 563 (1819) Fingerh., *l.c.*, p. 20.

Pungo Andongo.—Fruit spherical, strongly pungent. Cultivated in Sansamanda; fr. 30 April 1857. No. **6070**.

5. **C. cordiforme** Miller, *l.c.*, n. 2; Fingerh., *l.c.*, p. 29, tt. 9, 10.

Ambriz.—Cultivated; in fr. No. **6035**. At Mubango, wild; fl. and fr. No. **6037**.

Calumbo.—A shrub, 3 ft. high or more, strongly branched above: branches bent in a zigzag manner; calyx obtusely pentagonal, bent down in flower, almost truncate at the mouth, obscurely 5-toothed, the teeth obtuse; corolla from yellow to greenish, with ovate-acuminate lobes; anthers cordate-ovate, dull green. At Quilombo between Camama and Calumbo, wild; fl. and fr. June 1858. Native name of the shrub "Molûngŏ" and of the fruit "N-dungo-Jindungo." See Ficalho, Pl. Uteis, p. 233 (1884). No. **6047**.

Golungo Alto.—In secondary thickets near Cacarambola: fr. without foliage, beginning of Sept. 1856. Apparently this species. No. **6097**.

Pungo Andongo.—Fruit ellipsoidal-clavate, pungent. Cultivated in Sansamanda ; fr. 2 May 1857. Perhaps this species ; compare the variety *olivæforme* Dunal (*C. olivæforme* Miller, *l.c.*, n. 6). No. **6069**.

5. **PHYSALOIDES** Moench, Meth. Pl. p. 473 (1794), non Suppl. p. 178 (1802).

Withania Pauq. Diss. Bellad. p. 14 (1824) ; Benth. & Hook. f. Gen. Pl. ii. p. 893.

1. **P. somnifera** Moench, *l.c.*

Physalis somnifera L. Sp. Pl., edit. 1, p. 182, n. 1 (1753) ; J. A. Schmidt, Beitr. Fl. Cap. Verd. Ins. p. 236 (1852). Cf. *Physalis* (sp.), Welw. in Bol. Cons. Ultr. Lisb. No. 7, p. 83, n. 74 (1854).

Benguella.—A herb, sometimes suffruticose, sometimes frutescent and hard-woody at the base ; flowers sordid-yellow. In bushy sandy submaritime places at the river Cavaco, not uncommon ; fl. and fr. 19 June 1859. No. **6027**.

Mossamedes.—A dichotomously branched, melancholy-looking shrub, 4 to 7 or even 8 ft. high ; leaves elliptic-lanceolate, shortly acute ; flowers yellowish ; berries scarlet. In sandy thickets at the banks of the river Bero ; fl. and fr. July 1859. No. **6027***b*.

Huilla.—An erect undershrub ; stems several, 3 ft. high ; calyx clothed with a snow-white felt when young and during the flowering, afterwards turning green ; corolla from green to yellowish. In hilly bushy rather dry places near Lopollo, sporadic ; fl. Jan. 1860. No. **6025**.

Cape de Verde Islands.—In the island of San Thiago ; fr. Jan. 1861. No. **6060**.

6. **PENTAGONIA** Heister ex Fabric. Enum. Pl. Hort. Helmstad., edit. 1, p. 184 (1759) ; non Vent. (1841), nec Benth. (1844), nec Moehring (1736).

Physalodes Boehmer in Ludwig, Defin. Gen. Pl., edit. 3, p. 41 (1760). *Nicandra* Adans. (1763) ; Benth. & Hook. f. Gen. Pl. ii. p. 897 ; non Schreb. (1789).

1. **P. physalodes.**

Atropa physalodes L. Sp. Pl., edit. 1, p. 181 (1753). *Nicandra physaloides* Gærtn. Fruct. ii. p. 237, t. 131, f. 2 (1791) ; Welw. Apontam. p. 551, sub n. 100. *Physalodes peruvianum* O. Kuntze. Rev. Gen. Pl. ii. p. 452 (1891). *Ph. physalodes* Britton in Mem. Torr. Club, v. p. 287 (1894).

Loanda.—Attaining 2 ft., flowering when 6 in. high. Near Maianga do Povo, wild ; fl. Jan. 1858. No. **6072**.

Prince's Island.—In fl. and fr. Sept. 1853. No. **6062**.

7. **LYCIUM** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 900.

1. **L. decumbens** Welw. ms. in Herb., sp. n.

A glabrescent shrublet, 1 to $1\frac{1}{2}$ ft. high ; stems prostrate, rather thick, somewhat ashy and shining, nodose, intricately branched, spiny ; branches rigid, mostly divaricate, nodose, spiny ; branchlets glandular-squamulose, leafy ; spines whitish, very rigid, acute, patent, $\frac{1}{6}$ to $\frac{1}{2}$ in. long ; leaves alternate and fasciculate, oblanceolate, rounded at the apex, wedge-shaped to

the sessile or subsessile base, fleshy, glandular-squamulose at least beneath, glaucescent, $\frac{1}{5}$ to $\frac{3}{5}$ in. long by $\frac{1}{20}$ to $\frac{1}{8}$ in. broad, flat, entire; flowers axillary, solitary, $\frac{2}{5}$ in. long; peduncle about $\frac{1}{7}$ in. long; calyx campanulate, $\frac{1}{5}$ in. long, pale green, shortly trifid, glandular-squamulose outside; lobes more or less broadly ovate, obtuse, shortly ciliolate, $\frac{1}{10}$ to $\frac{1}{15}$ in. long; corolla funnel-shaped, from yellowish to violet-coloured, glabrous outside, veiny; deeply cleft down one side, otherwise shortly lobed; throat glandular-bearded; the limb pentamerous, imbricate; the lobes rounded, about $\frac{1}{8}$ in. long; stamens 5, rather shorter than the corolla, rather unequal, inserted on the corolla-tube about level with the top of the calyx; filaments hairy towards the base; style slightly longer than the stamens, shortly cleft at the apex.

Mossamedes.—On elevated maritime rocks covered with blown sand, near Cabo Negro; fl. Sept. 1859. No. **6024**.

This species has somewhat the aspect of *L. arabicum* Schweinf., but it differs by the fewer calyx-lobes and by the hairiness of the lower part of the filaments, etc.

8. **DATURA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 901.

1. **D. Stramonium** L. Sp. Pl., edit. 1, p. 179 (1753); Welw. Apontam. p. 551, sub n. 100 (1859).

Loanda.—In poor pastures at the coast near Conceição; fr. 24 Aug. 1854. No. **6051**.

Mossamedes.—In bushy sandy places at the banks of the river Bero, near Quipola; fl. and fr. July 1859. No. **6030**.

2. **D. fastuosa** L. Syst. Nat. edit. 10, ii. p. 932 (1759); Welw. Apontam. p. 551, sub n. 100 (1859).

Var. **alba** C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. p. 243 (1883).

D. alba Nees in Trans. Linn. Soc. xvii. p. 73 (1834); Welw., *l.c.*, p. 590, n. 84.

Loanda.—Peduncles glabrous, axillary; calyx but little or scarcely inflated at the base, simply tubular, 5-nerved, green between the nerves with raised veiny rugosities; corolla yellow-greenish when young, soon turning white, transversely wrinkled at the nerves which run out into the lobes; capsule globose, shining, brown, beset all over with pyramidal prickles which are rather hard at the apex; seeds reniform, brown. In cultivated plots and neglected fields, more or less solitary; at Imbondeiro dos Lobos; fl. and fr. end of July 1858. The flowers give off the nauseous smell of the genus less than the leaves. No. **6042**. Stem 3 to 4 ft. high, divaricately branched, atropurpureous, quite shining, woody at the base; flowers not fœtid; the tube pale whitish-yellowish. On maritime sands of the Cazanga island, where it is wild and abundant; fl. and fr. 14 Mar. 1858. The shining violet colour of the stems and leaves ornament the very white sands to a remarkable degree, especially when the not less abundant *Tribulus terrestris* is also present with its large golden-yellow flowers. Apparently indigenous. No. **6043** and Coll. Carp. 804.

Golungo Alto.—Flowers white, large, sub-pendulous. About negro villages, not uncommon; fl. and fr. Feb. 1855. No. **6061**. Capsule more or less spherical, rather depressed at the apex; muricate,

with short and straight prickles. About negro villages near Sange; seeds Feb. 1855. Native name, "Jila-Andundo." Coll. Carp. 805.

Benguella.—An annual, erect, divaricately branched herb, 3 to $3\frac{1}{2}$ ft. high; leaves densely pubescent, subtomentose; flowers white, nauseous in scent also in dry places. In sandy maritime places about Benguella, plentiful; fl. and fr. end of June 1859. No. **6023**.

Mossamedes.—An erect, branched herb, 3 ft. high and more; flowers white. In gravelly places by the banks of the river Bero; fl. June 1860. No. **6029**.

The Jila-Andundo occurs about dwellings on rubbish heaps; in Dembos it is called "Mutumbella"; in both the districts it is used as a narcotic to drug palm wine. When a robbery takes place, the negroes use a mixture of palm wine with the pounded leaves of Jila-Andundo in order to discover the thief: the mixture when drunk produces a condition bordering on madness.

9. **CESTRUM** L.; Benth. & Hook. f. Gen. Pl. ii. p. 904.

1. **C. Parqui** L'Herit. Stirpes Nov. fasc. iv. p. 73, t. 36 (1788).

Prince's Island.—A shrub as tall as a man, with erect small trunk-like stems and yellow flowers; fl. and fr. Sept. 1853. According to Welwitsch this appeared indigenous. No. **6063**.

10. **NICOTIANA** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. 906.

1. **N. Tabacum** L. Sp. Pl., edit. 1, p. 180 (1753).

Icolo e Bengo.—At the banks of the river Bengo, near Funda, wild; fl. and fr. Sept. 1854. The leaves range up to $14\frac{3}{4}$ in. long. No. **6044**.

Loanda.—About Imbondeiro dos Lobos, cultivated and afterwards sporadically and rather rarely half-wild; fl. June 1858. A broad-leaved form. No. **6045**.

There is in the collection, No. **6073**, perhaps another species of this genus, from the Ambriz district, near the river Quizembo, in fl. and fr.; it is an annual herb, $1\frac{1}{2}$ ft. high, erect, simple, with leaves lanceolate narrowed towards both ends and ranging up to 4 in. long by $\frac{2}{3}$ in. broad, flowers nearly 2 in. long and with apiculate corolla-lobes.

11. **SCHWENKIA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 911.

1. **S. americana** L. Gen. Pl., edit. 6, App. p. 567 [577] (1764).

Sierra Leone.—In fl. and fr. Sept. 1853. No. **5923**.

Loanda.—An annual herb, stems cæspitose, ascending; flowers somewhat like in shape to those of a lobelia, from greenish to bluish, pentamerous. Very plentiful in pastures near Quicuxe and along nearly the whole coast as far as Ambriz; fl. and fr. Jan. and May 1859. Native name "Casuanze." The whole plant in a decoction is good in cases of chest complaints. No. **5914**. In manioc plantations; fr. Dec. Coll. Carp. 809.

Golungo Alto.—A herb, $1\frac{1}{2}$ ft. high, annual and biennial; stems ascending or arching-erect; flowers sordidly whitish-violet-greenish; corolla-tube long, narrow, slightly curved; the limb subequally 5-lobed; the sinus-appendages exceeding the lobes, clavate, obtuse; stamens 4 or 5 (?), only two of them with fully developed anthers; style filiform; stigma capitate; capsule bivalved at the apex, 2-celled; seeds numerous, angular. In rather dry places at roadsides, abundant: near Sange, fl. and fr. Aug. 1856. No. **5898**. In sunny sandy places

in manioc plantations, near Aguas Doces; fl. and fr. June 1855. No. **5901**. A herb with the habit of *Lobelia* or *Cephalostigma*. By roadsides near Sange among low bushes; fl. and fr. No. **5902**. Between Trombeta and Cabondo; fl. and fr. Sept. 1854. No. **5903**.

LXXXIX. SCROPHULARIACEÆ.

1. **APTOSIMUM** Burch.; Benth. & Hook. f. Gen. Pl. ii. p. 927.

1. **A. lineare** Marl. & Engl. in Engl. Bot. Jahrb. x. 250 (1888).

Mossamedes.—A low undershrub, scarcely 9 in. high, very densely cæspitose, forming clumps 1 to 2 ft. in diameter after the manner of the spiny species of *Astragalus*, with the petioles spiny after the fall of the leaf-blades, hard; flowers sublabiate, blue; style simple, with a capitellate-truncate stigma; fruit woody, bivalved, bilocular, the valves bifid at the apex, the cells many-seeded, the seeds black and scrobiculate. In sandy-stony places on a red-sand rock at the base of Serra de Montes Negros, rather rare; fl. and fr. 10 Aug. 1859. No. **5817**. In the mountainous rocky parts of Caldeira do Inferno, damaged by sheep; fr. June 1860. No. **5818**.

2. **A. decumbens** Schinz in Verh. Bot. Brand. xxxi. 184 (1890).

Bumbo.—In neglected fields after cultivation of *Arachis hypogæa*, plentiful; fl. and fr. Oct. 1859. No. **5804**.

Huilla.—In pastures flooded in the rainy season, near Lopollo towards Empalanca; fl. and fr. Nov. 1859. A less hairy form. No. **5803**.

3. **A. Welwitschii** Hiern, sp. n.

An undershrub, branched from the base; branches decumbent or ascending, 4 to 12 in. long, leafy and densely pubescent above with pale subfulvous gland-tipped spreading hairs, more or less leafless sub-glabrate and scattered with dusky specks below, spiny chiefly below; spines $\frac{1}{2}$ to 1 in. long, straight; leaves linear-oblanceolate, pointed at the apex, much attenuate to the sessile or subsessile base, subscabrid, closely beset with short rather stiff gland-tipped hairs, entire and narrowly revolute on the cartilaginous margins, 1 to $1\frac{1}{2}$ in. long by $\frac{1}{10}$ to $\frac{1}{6}$ in. broad; flowers axillary, solitary, subsessile; bracts $\frac{1}{8}$ to $\frac{1}{4}$ in. long, linear, hairy; calyx $\frac{1}{6}$ to $\frac{1}{4}$ in. long, deeply lobed; the lobes linear, hairy outside, glabrous inside; corolla $\frac{2}{3}$ to $\frac{3}{4}$ in. long, membranous veiny, glandular-hairy outside; the tube about $\frac{1}{8}$ in. in diameter, much narrowing towards the base; filaments of the fertile stamens slender, glabrous, $\frac{1}{4}$ in. long; fertile anthers 2, unilocular, somewhat hispid or ciliate, $\frac{1}{12}$ by $\frac{1}{16}$ in.; style nearly $\frac{1}{2}$ in. long; capsule $\frac{1}{6}$ in. long, shortly hairy outside; young seeds papillose.

Mossamedes.—In gravelly places by the river Maiombo at a place called A Maiombo; in late fl. June 1860. No. **5816**.

This should be compared with *A. arenarium* Engl., *l.c.*, and *A. scaberrimum* Schinz, *l.c.*, p. 185, the types of neither of which have I seen; from the former it differs by the size and other characters of the foliage, and from the latter by its less scabrid scarcely acute leaves.

2. **ANTICHARIS** Endl.; Benth. & Hook. f. Gen. Pl. ii. p. 928.

1. **A. linearis** Hochst. ex Aschers. in Monatsber. Akad. Wiss. Berl. 1866, p. 882 (1867).

Doratanthera linearis Benth. in DC. Prodr. x. p. 347 (1846).

MOSSAMEDES.—An annual, erect, branched herb, about 4 to 9 in. high, with the aspect of *Linaria viscida* Moench, glandular-viscid throughout; stem and branches slender, purple; corolla salver-shaped, the tube gradually widened, the limb 5-cleft, the segments obtuse with one larger than the others forming a subringent corolla, the tube whitish-yellow, the limb violet-coloured spotted inside with purple; capsule 2-celled; seeds numerous, turning yellow, longitudinally furrowed. In rocky maritime places at Praia da Amelia and about Santo Antonio, plentiful; fl. and very few fr. 20 July 1859. No. **5810**.

Our specimens differ from the typical form of the species by the bracteoles being inserted below the middle of the peduncles.

2. **A. Aschersoniana** Schinz in Verh. Bot. Brandenb. xxxi. p. 188 (1890).

MOSSAMEDES.—An annual herb, from 3 in. to 1 or 2 ft. high, at first erect and sub-simple, soon decumbent and branched; branches and branchlets erect or ascending, glandular-viscid throughout; flowers very elegant, with the habit of *Maurandia*; corolla tubular-funnel-shaped, sublabiate, the tube yellowish-azure, the throat atropurpureous, the limb blue outside and blackish purple inside. In sandy places at the banks of the river Bero, very plentiful; fl. and fr. June to Aug. 1859. No. **5815**. An erect, slender, annual herb, 1 to 2½ ft. high, with violet-coloured flowers. In moist sandy somewhat bushy places near Mata dos Carpinteiros, rare; not in full fl. at end of June 1859, fl. in Sept. 1859. A form with less divaricate and more moderately glandular-pubescent branches and longer and narrower leaves than in the previous No.; the anthers agree. No. **5814**.

3. **DICLIS** Benth.; Benth. & Hook. f. Gen. Pl. ii. p. 932.

1. **D. sessilifolia** Diels in Engl Bot. Jahrb. xxiii. p. 473 (1897).

HUILLA.—An erect, annual herb, with the habit of a small *Tozzia*, very rapidly becoming limp; stem tetragonal, branched; branches elongated, opposite; leaves subsessile, opposite; calyx-segments 5, the posterior one the largest; corolla yellow, coloured at the base and on the spur with purple streaks; the tube very short, the throat dilated, the limb two-thirds way bilabiate, the upper lip short bilobed and spurred behind, the lower lip trifid, the middle lobe larger than the others and emarginate; stamens 4, didynamous; anthers approximated by pairs, unilocular; ovary bilocular; the placentas semicylindrical, turned towards the dissepiment; style short, straight, stigma capitate; fruiting pedicels reflected; capsule perfectly spherical, scarcely emarginate, bilocular, bivalved, the valves deeply emarginate. In a damp pasture by the Humpata river, plentiful but seen only in one place; fl. and fr. 24 April 1860. No. **5771**, and COLL. CARP. 812.

4. **SUTERA** Roth, Bot. Bemerk. p. 172 (1807).

Palmstruckia Retz, Obs. Bot. Pugill. 15 (1810), non Sond. (1860).

Chænostoma Benth. in Hook. Comp. Bot. Mag. i. p. 374 (1836); Benth. & Hook. f. Gen. Pl. ii. p. 945. *Lyperia* Benth., *l.c.*, p. 377; Benth. & Hook. f., *l.c.*; non Salisb. (1866).

Sutera Roth, Nov. Pl. Sp. p. 291 (1821), is *Jamesbrittenia* O. Kuntze, Rev. Gen. Pl. ii. p. 461 (1891) and the *Sutera* of Benth. & Hook. f., *l.c.* I do not concur with O. Kuntze, *l.c.*, iii. 2, p. 235 (1898) in uniting *Manulea* L. with *Sutera* Roth (1807).

1. **S. corymbosa.**

Chænostoma corymbosum Marloth & Engl. in Engl. Bot. Jahrb. x. p. 253 (1888).

var. **huillana.**

C. corymbosum β. *huillanum* Diels in Engl. *l.c.*, xxiii. 474 (1897).

Mossamedes.—An annual, erect or ascending herb, 1 to 2 ft. high, viscid throughout; corolla from whitish to yellowish, marked with purple veins, the tube violet-coloured. In sandy-muddy places among herbs and bushes by the banks of the river Maiombo, near Pedra do Rei and Pedra de Sal; fl. and fr. Oct. 1859. No. **5806**.

I have not seen the type of this species.

2. **S. heucherifolia.**

Chænostoma heucherifolium Diels, *l.c.*, p. 475.

Mossamedes.—An annual, herbaceous-green herb, 4 to 12 in. high, branched from the base; leaves membranous, rather limp; corolla white, somewhat yellowish on the tube and at the throat, the limb regular. In sandy and rocky places at the banks of the river Bero near Cavalheiros, plentiful; fl. and fr. July and Aug. 1859. No. **5805**.

This species closely resembles in general *S. lyperiæflora* = *Urbania lyperiæflora* Vatke in Œsterr. Bot. Zeitschr. xxv. p. 10 (1875), but the calyx-segments are rather acute and the corolla a little larger, etc.

3. **S. huillana.**

Chænostoma huillanum Diels, *l.c.*, p. 477.

Huilla.—A slender shrublet, 2 to 3 ft. high, with the habit of its flowers almost like a *Striga*; branches patently erect or spreading; leaves green in the living state, turning yellowish with impressed points in the dry state, rather fleshy; corolla brilliantly purple-red. In hilly wooded places between Mumpulla and Arroiol do Caionda, very sparingly; fl. and fr. June 1860. No. **5834**.

This species has the aspect of *S. Burkeana* (*Lyperia Burkeana* Benth.), but the corolla-tube is glabrous outside.

4. **S. aurantiaca.**

Buchnera aurantiaca Burch. Trav. S. Afr. i. p. 388 (1822). *Lyperia multifida* Benth. in Hook. Comp. Bot. Mag. i. p. 380 (1836).

Pungo Andongo.—Near Condo at the banks of the river Cuanza on a sandy loamy soil previously flooded; without fl. or fr. March 1857. Our specimens are only young plants; they should be compared with this species. Determination doubtful. No. **1227**.

5. **NEMIA** Berg. Pl. Cap. pp. 160, 162 (Aug. 1767).

Manulea L. Mant. Pl. p. 12 (Oct. 1767); Benth. & Hook. f. Gen. Pl. ii. p. 946.

As to the circumstances attending the publication of Bergius' name, see Van Hall, Epist. Ined. C. Linn. pp. 91, 92, 103 (1830).

1. **N. angolensis.**

Manulea angolensis Diels in Engl. Bot. Jahrb. xxiii. p. 478 (1897).

Huilla.—Corolla sordid orange in colour, the limb subringent. In moist bushy places near a cataract; fl. end of Oct. 1859. No. **5836**. An annual or biennial herb; root rather thick or even more or less turnip-shaped; radical leaves rosulate; stem straight, ending in paniculate racemes of flowers; flowers orange-dusky, very slender, rather fleshy: corolla-tube long; the limb 5-cleft, sub-bilabiate; the four upper lobes approximated, the fifth bent down; stamens scarcely reaching the throat of the corolla; style simple; stigma a little thickened. In bushy pastures near Lopollo, plentiful; fl. and fr. 9 Jan. 1860. No. **5335**.

This is nearly related to *N. parviflora* (*M. parviflora* Benth.).

6. **MIMULUS** L.; Benth. & Hook. f. Gen. Pl. ii. p. 946.

1. **M. gracilis** Br. Prodr. p. 439 (1810).

Pungo Andongo.—An annual herb; rhizome oblique, its fibres fasciculate; flowers from whitish tending somewhat to a violet colour. In marshy meadows at the banks of the river Luxillo, sparingly; fl. and fr. March 1857. No. **5874**. Stem erect or ascending, slightly branched, 1½ ft. high; calyx tubular, alate-pentagonal, the limb subequally 5-cleft, the lobes keeled and erect; corolla whitish straw-coloured, tubular, bilabiate, the upper lip emarginate, the lower lip 3-lobed, the middle lobe larger than the lateral ones and ornamented on the disk with orange-yellow points; stamens 4, didynamous, inserted on the corolla-lobe, included or scarcely exserted; anthers all fertile; ovary ovoid-ellipsoidal, 2-celled, the cells many-seeded; style somewhat flattened, spathulate towards the apex and there stigmatose. By marshes and in damp sandy places at the west Luxillo river, rather rare; fl. and fr. April 1857. No. **5855**.

Mossamedes.—An erect herb with the habit of a *Gratiola*; rhizome with numerous fibres; stems several; flowers white-rosy. In sandy-muddy places at the river Bero, rather rare; fl. July 1859. No. **5807**. In like places at the banks of the river Bero near Cavalheiros, sporadic; not yet in full fl. July 1859. No. **5808**.

Huilla.—Flowers white. In swamps close to the Lopollo stream; fl. and fr. Dec. 1859. No. **5796**.

7. **STEMODIACRA** P. Browne, Hist. Jam. 261, t. 22, f. 2 (1756).

Stemodia L. Syst. Nat., edit. 10, ii. p. 1118 (1759); Benth. & Hook. f. Gen. Pl. ii. p. 950; Wettst. in Engl. Nat. Pflanzenfam. iv. 3*b*, p. 74 (1891). *Ambuli* Adans. Fam. Pl. ii. p. 208 (1763). *Matourea* Aubl. Pl. Guian. ii. p. 641, t. 259 (1775). *Dickia* Scop. Introd. p. 199 (1777). *Ambulia* Lam. Encycl. i. p. 128 (1783); Wettst., *l.c.*, p. 73. *Diceros* Lour. Fl. Cochinch. p. 381 (1790). *Hydropityon* Gærtn. f. Fruct. iii. p. 19, t. 183 (1805). *Limnophila* R. Br. Prodr. p. 442 (1810); Benth. & Hook. f., *l.c.*

I follow Ferd. v. Mueller in uniting the two genera cited from Bentham & Hooker f., since I am unable to distinguish them by valid characters: the following species belong to the section Limnophila:—

1. **S. sessiliflora.**

Hottonia sessiliflora Vahl, Symb. Bot. ii. p. 36 (1791). *Limnophila sessiliflora* Blume, Bijd. Fl. Ned. Ind. p. 749 (1826). *Stemodia sessiliflora* Ferd. Muell. Syst. Cens. Austral. Pl. p. 97

(1882). *Terebinthina sessiliflora* O. Kuntze, Rev. Gen. Pl. ii. p. 468 (1891).

HUILLA.—Habit of a *Limnophila* : flowers purplish. In rivulets at the point of drying up and at their banks, from Lopollo to Catumba ; fl. and fr. Dec. 1859 and April 1860. The seeds are obtusely angular. No. **5777**. Annual; habit of a *Myriophyllum* ; stems crowded, sparingly branched, cylindrical, obsoletely striate, spongy-lacunose, floating ; leaves 5- to 11-verticillate, the submerged ones capillary-multifid, the emerged ones unlobed, mostly deeply tridentate, rosulate, all more or less impressed-areolate on the surface ; calyx-teeth here and there unidentate at the tip ; corolla violet-whitish, the tube with a yellowish tinge ; the limb with 3 lower segments and 2 upper lobes ; stamens 4, didynamous, the anthers bilocular and cohering in pairs ; ovary 2-celled ; style rather short ; stigma bilamellate ; capsule bisulcate, bilocular, rather compressed. In streams from Lopollo to Nene and towards Ohai, plentiful, in company with *Potamogeton javanicus* Hassk. (Welwitsch No. 248) and species of *Ottelia* ; fl. and young fr. middle of May 1860. No. **5776**.

2. **S. ceratophylloides** Hiern, sp. n.

A herb with the habit of a *Ceratophyllum*, submerged or at the time of flowering with the upper part of the stems emerged ; stems subcylindrical, glabrous, slender, about a foot long, branched, at length bare towards the base, leafy above ; leaves verticillate, capillary-multifid, $\frac{3}{4}$ to 1 in. long, rather rigid in the living state ; flowers axillary, subsessile ; calyx membranous, shortly 5-cleft ; capsule (not quite ripe) ellipsoidal, sub-compressed, bisulcate, somewhat emarginate at the apex, 2-celled, 2-valved, about $\frac{1}{8}$ in. long, the valves septiferous along the middle ; placentas adnate on both sides to the septum, fleshy, forming a central cylindrical column ; unripe seeds several, rather large, apparently horizontal, ellipsoidal-ovoid, smooth, with a protruding hyaline aril at the base.

HUILLA.—In the deeper muddy streams between Lopollo and Humpata ; also in streams and in the neighbouring limpid pools in Morro de Lopollo and on the Humpata plateau near Nene ; in young fr. April 1860. No. **5778**.

This is the *Limnophila* referred to by Welwitsch in Journ. Linn. Soc. v. p. 187 (1861).

3. **S. tenera** Hiern, sp. n.

A nearly glabrous, tender, erect herblet, 1 to 2 in. high, cæspitose, apparently annual ; stems numerous ; branches spreading ; leaves opposite, lanceolate or sublinear, scarcely acute or sub-apiculate at the apex, but little narrowed at the sessile clasping base, entire, $\frac{1}{12}$ to $\frac{1}{3}$ in. long, spreading ; flowers axillary and terminal or quasi-terminal, mostly alternate, solitary and spreading, about $\frac{1}{8}$ in. long ; peduncles $\frac{1}{8}$ to $\frac{1}{4}$ in. long ; bracts subulate $\frac{1}{12}$ to $\frac{1}{10}$ in. long ; calyx $\frac{1}{10}$ to $\frac{1}{8}$ in. long, 5-partite, bibracteate at the base, the segments subulate, erect or at length reflected ; corolla bilabiate, from whitish to pale blue, slightly glandular-puberulous outside, somewhat pilosulous about the throat inside ; stamens 4, didynamous ; anthers short, 2-celled ; capsule about

$\frac{1}{20}$ in. long, 2-valved; seeds netted-areolar, irregularly ovoid, about $\frac{1}{60}$ in. long.

Pungo Andongo.—In swampy places at the lake of Quibinda then almost dry; fl. March 1857. Only one clump seen. No. **1241**.

This should be compared with small states of *S. indica* (*Hottonia indica* L. = *Limnophila gratioloides* R. Br.), though they apparently differ.

8. **MONIERA** B. Juss. ex P. Browne, Hist. Jamaic. p. 269, t. 28, f. 3 (1756); non Loefl. (1758).

Brami Adans. Fam. Pl. ii. p. 208 (1763). *Mella* Vand. Fl. Lusit. p. 43, f. 23 (1788). *Septas* Lour. Fl. Cochinch. p. 392 (1790). *Mecardonia* Ruiz & Pav. Prodr. Fl. Per. p. 95 (1794). *Calyptriplex* Ruiz & Pav., *l.c.*, p. 96. *Herpestis* Gaertn. f. Fruct. iii. p. 186, t. 214 (1805); Benth. & Hook. f. Gen. Pl. ii. p. 951.

1. **M. calycina.**

Herpestis calycina Bth. in Hook. Comp. Bot. Mag. ii. 57 (1836).

Ambriz.—An annual, creeping herb; branchlets ascending or erect, rather fleshy, mostly turning purple; flowers white. By streams in rather elevated bushy places near Ambriz, plentiful; fl. and fr. Nov. 1853. No. **5918**.

Golungo Alto.—In marshy wooded places near Calôlo; fr. Sept. 1854. No. **5909**.

Cazengo.—At the sides of streams near Dalatanda, growing after the fashion of *Isnardia*; fr. and a few fl. June 1855. No. **1262**.

Pungo Andongo.—Fl. Dec. 1856. No. **5875**. Fl. and fr. No. **5877**.

2. **M. occultans** Hiern, sp. n.

A herb, apparently annual; root fibrous; stem branched from the base, procumbent, ascending, pale reddish, obtusely quadrangular, bisulcate, pluristriate, juicy, 3 to 12 in. long, puberulous, leafy especially towards the apex; leaves opposite, spreading, oblong-lanceolate, rather obtuse at the apex, rounded at the nearly sessile sub-amplexicaul base, serrulate along the upper half, herbaceous-membranous, glabrous, about an inch long by a quarter-inch broad or a little more, pale green above, glaucescent and dotted beneath, pellucid-punctate, rather obscurely so in some cases; flowers small, axillary, solitary or a few together; peduncles very short; calyx-segments 5, unequal; the outer 3 ovate, obtuse, $\frac{1}{4}$ in. long, the inner ones lanceolate-linear, all surrounding and adnate to the base of the ovary, at length concealing the fruit; corolla white; the tube funnel-shaped, short, straight; the limb sub-bilabiate, 5-cleft; the lobes obtuse, somewhat spreading; stamens 4, didynamous, inserted on the corolla-throat; filaments smooth, but little arched; anthers all fertile, not bearded; ovary oblong-conical, 2-celled; the cells pluri-ovulate; the ovules horizontal; placentas central, radiating towards the periphery; style filiform; stigma bicapitate.

Pungo Andongo.—In marshes and gently flowing streams from Caghuy towards Condo, plentiful; fl. and young fr. March and May 1857; also at the Miêge stream near the lake of Quibinda, very rare, and near Sansamanda; fl. March 1857. No. **5891**.

Nearly related to *M. calycina*, but differs in habit, foliage, etc.

9. **CRATEROSTIGMA** Hochst.; Benth. & Hk. f. Gen. Pl. ii. 954.
Dunalia Br. in Salt, Abyss., App. p. lxiv (1814) nomen; non H. B. & K. (1818).

The species which have been added to this genus subsequently to Benth. & Hook. f., *l.c.* (1876) have made the discrimination of it from *Torenia* increasingly difficult; I have, however, followed Dr. Engler in his treatment of them.

1. **C. plantagineum** Hochst. in Herb. Schimp. Abyss. i. n. 310 (*U. i.* 1840), and in Flora xxiv. p. 669 (1841).
Torenia plantaginea Benth. in DC. Prodr. x. p. 411 (1846).

Huilla.—Corolla white, with a yellow lip. In sandy swampy pastures and in neglected fields by the road which leads towards Gambos, tolerably plentiful; fl. and fr. Jan. and beginning of Feb. 1860. No. **5785**. Habit primulaceous; leaves rather fleshy, rigid, thick, rosulate; petiole bright scarlet; corolla white, with a yellowish lip and violet-coloured helmet. In sandy-clayey swampy places in short grass and also in neighbouring fields, plentiful; fl. and young fr. Jan. 1860. No. **5786**. A perennial herb, scarcely 2 to 4 in. high, with the habit of a *Streptocarpus*; flowers yellowish blue, very elegant. At Lopollo; fr. 28 Jan. 1860. Apparently this species. Coll. Carp. 810.

2. **C. crassifolium** Engl. Bot. Jahrb. xxiii. p. 500 (1897).

Pungo Andongo.—An annual herb, scarcely 2 in. high; branchlets erect-spreading; leaves rather fleshy, subglaucescent-green; corolla from whitish to yellowish; the upper lip marked with longitudinal purple lines. In exposed moist places among the more elevated gigantic rocks of Santo Antonio in the præsidium; fl. and fr. April 1857. No. **5869**. A rather viscid, annual, erect, branched herb, 2 to 4 in. high, with the habit of *Euphrasia*; leaves opposite; flowers whitish, rather large, bilabiate, with striped lips. In sandy open pastures between Candumba and Lombe, growing plentifully and occupying broad tracts in dense masses; likewise abundant between Bumba and the great cataract of the river Cuanza near Condo; fl. and fr. March 1857. No. **5870**.

Huilla.—A suffruticose herb, scarcely a hand high, usually shorter; stem ascending, usually purplish, somewhat naked below, with numerous branches above; leaves rather fleshy and glossy, often bright purple beneath; corolla hypogynous, bilabiate, white; the tube exserted; the upper lip the shorter, subentire, ciliate, purple-streaked beneath; the lower lip trifid, the middle lobe the greatest, all three denticulate-fimbriate; the throat purple-striate; stamens 4, all fertile, the posterior pair the shorter; the filaments of the anterior ones inserted at the base of the lobes of the lower lip, bulbous-inflated at the base and bent backwards, then in the middle arched forwards again at an acute angle; anthers sub-cohering in pairs, 2-celled, the cells divaricate; style simple; stigma bi-lamellate. In damp pastures at an elevation of 5400 ft., and in sunny wooded places by streams near Lopollo, plentiful; fl. and fr. Jan. 1860. No. **5790**. Flowers whitish, turning somewhat yellow. In swampy open woods close to the river Monino; fl. and fr. Dec. 1859 and Jan. 1860. No. **5791**. Almost the entire plant deep red, except the whitish flowers. In elevated spongy parts of Morro de Monino; fl. and fr. end of Jan. 1860. No. **5792**. Towards Nene, intermixed with other species; fl. and fr. May 1860. No. **5794**.

3. **C. Schweinfurthii** Engl., *l.c.*, p. 501.
Torenia Schweinfurthii Oliv. in Hook. Ic. Pl. xiii. p. 41, t. 1251.
Pungo Andongo.—No notes. In fl. Nos. **5887** and **5888**.

4. **C. Welwitschii** Engl., *l.c.*
Huilla.—In damp pastures and frequently in neglected flooded fields ; fl. and fr. Dec. 1859 and Jan. 1860. No. **5775**.

5. **C. linearifolium** Engl., *l.c.*, t. viii. fig. G—L.
Huilla.—A herblet, doubtfully perennial ; leaves greenish purple ; corolla-tube and often the upper lip whitish-violet in colour ; the lower lip purple. In elevated places, in the clefts of rocks where rainwater ponds in summer, at Nene, plentiful ; fl. and fr. May 1860. No. **5782**.

The following No. possibly belongs to this genus, but the material is insufficient for determination :—
Huilla.—An annual, erect, glabrous herb, an inch high, with the habit of *Torenia* ; stem unbranched to the height of $\frac{1}{6}$ in., above with a few spreading branches ; leaves opposite, sub-linear, $\frac{1}{3}$ to $\frac{1}{2}$ in. long, pointed, sessile ; flowers axillary, solitary, shortly pedunculate, yellow ; corolla bilabiate, deep yellow, the upper lip abbreviated, the lower lip spreading and shortly trilobed. In moist pastures on the Humpata plateau, in company with species of *Polygala*, *Drosera*, and *Oxalis* ; only one specimen seen ; fl. 21 Feb. 1860. No. **5793**.

10. **TORENIA** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 954.

1. **T. parviflora** Ham. ex Wall. List, n. 3958 (1831) ; Benth. Scroph. Ind. p. 39 (1835).
Ambriz.—A herb, with membranous deep green leaves and purple flowers. In thickets at the river near Ambriz ; fl. and fr. Nov. 1853. No. **5917**.
Cazengo.—At Dalatanda ; fr. June 1855. No. **5910**.
Pungo Andongo.—No notes. In fr. Dec. 1856. No. **5876**.

2. **T. inæqualifolia** Engl. Bot. Jahrb. xxiii. p. 502 (1897).
Huilla.—An erect herblet, 1 to 3 in. high, annual, with the habit of *Veronica verna* L. ; branched from the base ; stem winged, tetragonal, purple ; leaves lanceolate, sessile, 1-nerved with the nerve in relief beneath, dentate towards the apex ; flowers rather small, deep blue ; calyx tubular, the tube very broadly winged, the limb bilabiately 5-cleft, the 3 teeth of the upper lip a little longer than the 2 teeth of the lower lip ; corolla-tube straight, the upper lip of the ringent limb entire at the apex, the lower lip with 3 somewhat flat lobes ; stamens 4, didynamous, inserted on the corolla-tube, all fertile, the posterior ones shorter than the others and with the filaments unappendaged at the base, the anterior ones inserted at the base of the lower lip of the corolla and furnished at the base with an obtuse yellow gland-like appendage ; anthers bilocular, the cells divaricate and confluent only at the apex ; ovary ellipsoidal, bilocular ; style filiform ; stigma clavate-thickened, very slightly or obsoletely bilobed at the apex. In moist pastures on the Humpata plateau near Empalanca ; plentiful ; fl. and fr. beginning of April 1860. No. **5783**. Annual ; flowers whitish, bilabiate. In pastures flooded in summer, near Humpata and Lopollo, plentiful ; fl. and fr. April 1860. Coll. Carp. 811.
This is perhaps identical with *T. spicata* Engl., *l.c.*, t. vii. fig. G—M.

11. **LINDERNIA** Allioni in Miscell. Taurin. iii. p. 178, t. 5, fig. 1 (1766). *Vandellia* P. Browne ex L. Mant. Pl. p. 12, n. 1265 (1767); Benth. & Hook. f. Gen. Pl. ii. p. 955.

1. **L. nummulariæfolia** Wettst. in. Engl. & Prantl, Nat. Pflanzenfam. iv. 3*b*, p. 79 (1891).

Vandellia numularifolia D. Don, Prodr. Fl. Nepal. p. 86 (1825). *Pyxidaria nummularifolia* O. Kuntze, Rev. Gen. Pl. ii. p. 464.

Pungo Andongo.—An annual herblet, inhabiting marshes and growing after the manner of a *Rorippa*; corolla pale blue variegated with yellow; the two anterior stamens exserted, sterile? In pools by the streams and springs of the præsidium, near Cabondo and Catete: fl. and unripe fr. end of Dec. 1856. No. **5872**. Flowers purple. In open rocky places among short grass in the præsidium; fl. and fr. April 1857. No. **5373**.

Var. **sessiliflora**.

Vandellia sessiliflora Benth. Scrophular. Indic. p. 37 (1835). *Mitranthus latifolius* Hochst. in Flora xxvii. p. 103 (1844). *M. triflora* Hochst. in Herb. Schimp. Abyss. iii. n. 1728 (*U.t.*, 1844); A. Rich. Fl. Abyss. ii. p. 120 (1851). *L. sessiliflora* Wettst., *l.c.* *Pyxidaria nummularifolia*, var. O. Kuntze, *l.c.*

Pungo Andongo.—A dwarf, annual, erect herblet, sparingly branched or simple; leaves opposite, subsessile, as are also the purplish flowers. In open rocky moist parts of the præsidium, sparingly; fl. and fr. April 1857. No. **5878**.

2. **L. diffusa** Wettst., *l.c.*, p. 80.

Vandellia diffusa L. Mant. Pl. p. 89 (1767). *Pyxidaria diffusa* O. Kuntze, *l.c.*

Sierra Leone.—An annual, branched herb; branches prostrate, rooting; flowers milk-white. In damp muddy places by the road in the ascent to the cataract of Sugar-Loaf mountain, above Freetown, plentiful; fl. and fr. Sept. 1853. No. **5924**.

3. **L. senegalensis**.

Vandellia senegalensis Benth. in DC. Prodr. x. p. 416 (1846). *Pyxidaria senegalensis* O. Kuntze, *l.c.*, p. 465.

Ambaca.—A herb, apparently perennial with a sub-tuberous root, prostrate, creeping, with the habit of *Gratiola*; flowers violet-red, quickly withering. By pools near springs between Pamba and Puri-Cacarambola, rather rare; fl. and fr. middle of Oct. 1856. No. **5913**.

4. **L. uvens** Hiern, sp. nov.

An annual herb, 2 to 4 in. high, nearly glabrous; stem erect, simple or nearly so, tetragonal, minutely scabrid-puberulous, slender, pale yellowish-green, leafy below, sparingly leafy above; leaves opposite or the uppermost floral ones alternate, ovate oblong or lanceolate, obtuse at the apex or the floral ones subacute, more or less broad at the sessile base, pale green, minutely glandular-punctate and pulverulent-puberulous, $\frac{1}{12}$—$\frac{1}{3}$ in. long, minutely ciliolate on the entire margins; flowers few, $\frac{1}{4}$ in. long, terminal and in the upper axils; peduncles very short, at their base with an ovate subacute pallid concave adpressed floral leaf of

$\frac{1}{10}$ to $\frac{1}{8}$ in. long; calyx campanulate-oblong, $\frac{1}{6}$ in. long, shortly 5-cleft; the teeth from an ovate base acuminate, acute, ciliolate, about half as long as the smooth tube; corolla bilabiate, blue; stamens 4, didynamous, all perfect; style $\frac{1}{8}$ in. long, rather thickened upwards; stigma rather dilated.

HUILLA.—In wet pastures on the Humpata plateau, rather rare; fl. April 1860. No. **5784**.

5. **L. ? montana** Hiern, sp. nov.

An erect puberulous herblet, simple or sparingly branched, annual, 1 to 2 in. high; stem and branches tetragonal, rather slender; branches alternate when present, erect-patent or spreading; leaves opposite, ovate or broadly elliptical, obtuse at the apex, obtusely narrowed or nearly rounded at the base, crenate-dentate on the narrowly cartilaginous margins, subsessile, $\frac{1}{6}$ to $\frac{1}{5}$ in. long by $\frac{1}{8}$ to $\frac{1}{3}$ in. broad; internodes mostly longer than the leaves; flowers subfasciculate in very abbreviated opposite axillary and terminal clusters, 2 to 4 together or solitary in each axil, subsessile or occasionally on slender pedicels ranging up to $\frac{1}{4}$ in. long, sometimes abortive; calyx hispidulous, $\frac{1}{12}$ to $\frac{1}{8}$ in. long; the teeth in fruit lanceolate-subulate, about $\frac{1}{2\frac{1}{4}}$ in. long or shorter, the tube more or less oblong; corolla pale purple; style $\frac{1}{2\frac{1}{4}}$ to $\frac{1}{16}$ in. long or in abortive flowers about $\frac{1}{8}$ in. long, minutely bifid and often capped at the apex with the remains of a portion of the marcescent corolla; fruit oblong, somewhat ellipsoidal, acuminate at the apex $\frac{1}{6}$ to $\frac{1}{4}$ in. long, 2-celled, the cells several-seeded, the pericarp thin, the seeds papillose-muriculate.

HUILLA.—In open mountainous places, carpeted with mosses and small Cyperaceæ, in Morro de Lopollo; in late fl. Dec. 1859 and in fr. end of Jan. 1860. No. **5787**.

This plant somewhat resembles in habit *Ilysanthes nana* Engl.

11. **ILYSANTHES** Rafin. Ann. Nat. p. 13 (1820); Benth. & Hook. f. Gen. Pl. ii. p. 955.

Bonnaya Link & Otto, Ic. Pl. Sel., fasc. 2, p. 25, t. 11 (1821); Benth. & Hook. f., *l.c.*, p. 956.

1. **I. Welwitschii** Engl. Bot. Jahrb. xxiii. p. 504, t. ix. (1897).

HUILLA.—Corolla whitish, the lower lip purplish. In very elevated damp places in Morro de Lopollo among mosses; fl. beginning of May 1860. No. **5781**.

2. **I. nana** Engl., *l.c.*, p. 505.

HUILLA.—A herb, annual in habit but apparently lasting for several years, 1 to 2 in. high, branched at the base or nearly simple; stem tetragonal; leaves rather fleshy, mostly purplish beneath; corolla white; the upper lip much narrower than the lower, bilobed at the apex, its lobes rather fleshy; the lower lip purplish, 3-lobed, its lobes denticulate, the middle one larger than the others and obovate; stamens 4, the two posterior ones fertile, the anterior ones inserted at the base of the lower lip and sterile. In open moist places near Lopollo; fl. and fr. Jan 1860. No. **5788**. Flowers purple. In the pastures of Empalanca among mosses, algæ, and short grasses; fl. and fr. end of Jan. 1860. No. **5789**.

3. **I. andongensis** Hiern, sp. nov.

An erect, usually much branched, elegant, slight herb, 2 to 3 in. high, glabrous throughout or minutely glandular; stem tetragonal; branches more or less divaricate, opposite or alternate; leaves opposite, oval-oblong, obtuse at the apex, somewhat narrowed to the rather broad sessile base, quite entire or scarcely repand, membranous, herbaceous-green on both faces, $\frac{1}{12}$ to $\frac{1}{3}$ in. long by $\frac{1}{32}$ to $\frac{1}{12}$ in. broad; venation inconspicuous; flowers numerous, axillary and terminal, alternate, about $\frac{1}{6}$ in. long; peduncles $\frac{1}{16}$ to $\frac{1}{2}$ in. long; calyx $\frac{1}{12}$ to $\frac{1}{6}$ in. long, funnel-shaped campanulate; its lobes 5, broadly ovate, rounded obtuse or scarcely apiculate at the apex, about half as long as the tube; corolla purple; the lower lip trifid, about $\frac{1}{12}$ in. long; the middle lobe broadly oblong, obtuse, $\frac{1}{24}$ in. long; the lateral lobes broadly ovate, rather obtuse, $\frac{1}{32}$ in. long; the upper lip subentire, $\frac{1}{16}$ in. long, obtuse, ovate; perfect stamens 2, posterior, with equal anther-cells; staminodia 2, anterior, with filaments, without anthers; fruit oblong or elliptic-oblong, about $\frac{1}{4}$ in. long; pericarp thin; seeds minutely papillose.

Pungo Andongo.—In damp pastures with short grass, between Candumba and the river Cuanza, plentiful; fl. and fr. March 1857. No. **5871**.

This is nearly related to *I. trichotoma* Urb., but the calyx-teeth are obtuse; the following No. possibly belongs here, as a variety:—

Pungo Andongo.—A very slender, annual herblet, with an erect stem and purple flowers. In the swampy parts of Pedras de Guinga, in company with *Utricularia exilis* Oliv.; fl. and fr. Jan. 1857. No. **5879**.

4. **I. stictantha** Hiern, sp. n.

An annual berb, $\frac{1}{2}$ to 1 ft. long, mostly prostrate or prostrate-ascending, slender, dichotomously or less commonly the upper ones trichotomously branched, nearly glabrous or minutely glandular-puberulous; stem and branches pale green, tetragonal; leaves opposite, ovate, subobtuse at the apex, rather abruptly narrowed at the subsessile or shortly petiolate base, glaucous at least beneath, somewhat fleshy or succulent, serrulate, inconspicuously nerved and veined, $\frac{1}{2}$ to 1 in. long by $\frac{1}{5}$ to $\frac{2}{3}$ in. broad; the serratures small, narrowly revolute on the margin; petioles ranging up to $\frac{1}{6}$ in. long; peduncles alternate, axillary, solitary, $\frac{1}{8}$ to $\frac{1}{2}$ in. long, sub-erect or in fruit more or less spreading; flowers solitary, $\frac{1}{5}$ to $\frac{2}{5}$ in. long; calyx oblong, somewhat narrowed at the base, $\frac{1}{4}$ to $\frac{1}{3}$ in. long; persistent, unequally 5-cleft; the tube 5-costate; the lobes lanceolate-subulate, nearly as long as or shorter than the tube; corolla white, scattered with atro purpureous dots; the upper lip undivided, straight, rounded at the apex, fringed; the lower lobe trifid, with spreading lobes; stamens 4, the two anterior ones fertile, style flattened; stigma laminiform, ovate; capsule linear-oblong, $\frac{2}{3}$ to $\frac{5}{6}$ in. long, acute at the apex.

Golungo Alto.—In the damp parts of palm groves on the left

bank of the river Cuango, near Arimo do Isidro, rather rare; fl. mostly fallen July 1855. No. **5905**. In palm groves at the river Cuango in Sobato da Queta; fl. and fr. July and Aug. 1855. No. **5906**.

This species belongs to the section Bonnaya.

12. **LIMOSELLA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 958.

1. **L. aquatica** L. Sp. Pl., edit. 1, p. 631 (1753).

Var. **alismoides** Welw. ms. in Herb.

Leaves very greatly varying in size, not uncommonly gigantic in proportion to the rest of the plant; stamens 4, sub-exserted, not evidently didynamous; anthers distant; style as long as the stamens, inclined to one side of the corolla; stigma capitellate.

Huilla.—Flowers whitish, at length almost rosy. In marshy muddy-sandy places by the Lopollo stream, plentiful; fl. and fr. end of Oct. and in Nov. 1859. No. **1131**. In flooded places by streams near Lopollo, at an elevation of 5500 ft., plentiful; fl. and fr. 31 Oct. 1859. No. **1132**. Sometimes annual, sometimes biennial, and apparently even perennial; fruiting peduncles almost always spirally recurved. A form, more robust in all respects gathered with No. 1132. The size and shape of the leaves are variable enough, but the size of the flowers is always the same whether in the smallest or largest specimens. By the margin of the Lopollo river, especially around the edges of pools close to the river, very abundant; fl. and fr. 28 and 31 Oct. 1859. No. **1132*b***. Leaves 3 to 5-nerved, floating after the manner of *Alisma natans*; flowers whitish, at length turning a violet colour. In flooded sandy places at the banks of the Lopollo river, at an elevation of 5500 ft. in masses, not uncommon; fl. and fr. Nov. 1859. A large-leaved floating form, but not separable by any characters specifically from the common species. No. **1133**.

This is the *Limosella* mentioned by Welwitsch in Journ. Linn. Soc. v. p. 187 (1861); it should be compared with *L. maior* Diels in Engl. Bot. Jahrb. xxvi. p. 122 (27 Sept. 1898), which may also prove to be only a form of the common species.

13. **SIBTHORPIA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 959.

1. **S. peregrina** L. Sp. Pl., edit. 1, p. 631 (1753).

Island of Madeira.—In moist places among short herbage, by the rocks between Funchal and Camara dos Lobos; fl. and fr. Aug. 1853. No. **5925**.

14. **SCOPARIA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 959.

1. **S. dulcis** L. Sp. Pl., edit. 1, p. 116 (1753).

Capraria dulcis O. Kuntze, Rev. Gen. Pl. ii. p. 459 (1891).

Sierra Leone.—In neglected fields and in moist herbaceous places about Freetown, plentiful; fl. and fr. Sept. 1853. No. **5921**.

Ambriz.—In hilly moist places near Quizembo, abundant; fl. and fr. Nov. 1853. No. **5920**. An annual or biennial herb, with white flowers. In hilly previously cultivated parts of Mossul-Ambriz, abundant; fl. and fr. Dec. 1853. "Herva dos vassiros." No. **5919**.

Prince's Island.—In the mountainous parts of the island; fl. and fr. Sept. 1853. No. **5922**.

Loanda.—At Loanda; fl. and fr. Nov. 1853. On a sandy clay soil, in moist places and around pools near Imbondeiro dos Lobos, plentiful; fl. and fr. beginning of Feb. 1858. In damp places between Quicuxe and Mutollo; fl. and fr. beginning of August 1858. No. **5915**.

Golungo Alto.—An undershrub, 2 to 3 ft. high ; flowers white ; stamens 4, not didynamous. In rather elevated somewhat dry declivities among the Queta mountains above Camilungo and near Carengue, rather rare ; fl. and fr. 19 Sept. 1856. No. **5899**.

Pungo Andongo.—No notes. Fl. and fr. No. **5892**.

15. **MELASMA** Berg. Pl. Cap. p. 162, t. 3, f. 4 (Aug. 1767) ; Benth. & Hook. f. Gen. Pl. ii. p. 956. *Nigrina* L. Mant. Pl. p. 5, n. 1246 (Oct. 1767). *Alectra* Thunb. Diss. Nov. Gen. iv. p. 81 (1784) ; Benth. & Hook. f., *l.c.*

The following species all belong to the section Alectra :—

1. **M. sessiliflorum**.

Gerardia sessiliflora Vahl, Symb. Bot. iii. p. 79 (1794). *Rhinanthus scaber* Thunb. Prodr. Pl. Cap. p. 98 (1800). *Alectra melampyroides* Benth. in DC. Prodr. x. p. 339 (1846). *A. sessiliflora* O. Kuntze, Rev. Gen. Pl. ii. p. 458 (1891). *Nigrina sessiliflora* O. Kuntze, *l.c.*, iii. 2, p. 237 (1898), partly.

Huilla.—Habit of *Melampyrum* ; flowers yellowish. In the wooded meadows of the Monino, sparingly and sporadic ; fl. beginning of April 1860. No. **5801**. An annual, erect, deep green, sub-parasitical herb ; stem tetragonal, rough ; leaves coarsely dentate, dilated at the base, rough ; flowers subsessile, axillary, solitary ; corolla yellow, galeate-bilabiate, red on the nerves, 5-cleft, the lobes obtuse ; stamens 4, didynamous, included ; filaments naked ; anthers 2-celled, attenuate at the base, apiculate, the cells parallel ; style simple ; stigma elongate-thickened, lingulate, recurved, bilobed at the apex, the lobes rather thick and somewhat flattened. In moist wooded meadows in short grass at the base of Morro de Lopollo ; in fl.-bud and with a few fl. 8 April 1860 ; at Empalanca and Nene, sporadic ; April 1860. No. **5802**.

2. **M. indicum** Wettst. in Engl. Nat. Pflanzenfam. iv. 3*b*, p. 91.

Hymenospermum dentatum Benth. in Wall. List, n. 3963 (1831). *Glossostylis avensis* Benth. Scroph. Ind. p. 49 (1835). *Alectra indica* Benth. in DC. Prodr. x. p. 339 (1846). *A. dentata* O. Kuntze, Rev. Gen. Pl. ii. p. 458 (1891).

Pungo Andongo.—An annual, erect herb : leaves membranous, curved ; flowers yellow. In moist places planted with manioc, near Calunga, at the sides of the river Miége ; fl. and fr. April 1857. No. **5849**. An annual, erect herb, simple below, alternately branched at the inflorescence, 1½ ft. high ; leaves subopposite. Perhaps the same species. No. **5894**.

This species has been united with *M. sessiliflorum* by O. Kuntze, Rev. Gen. Pl. iii. 2, p. 237 ; he calls both *Nigrina sessiliflora*. Our plants are doubtfully placed here and should be compared with the form *subpetiolatum* (O. Kuntze, *l.c.*, p. 238), the type of which I have not seen.

3. **M. rigidum** Hiern, sp. n.

An erect, scabrid, apparently annual, somewhat wiry herb, 9 to 12 in. high, branched from the base or simple ; stem rigid, more or less hispidulous ; branches erect or ascending, rather slender and tough, more or less hispid with short whitish hairs ; leaves opposite, linear-lanceolate or narrowly oval-oblong, obtuse at the apex, a little or scarcely narrowed at the sessile base, scabrid at

least on the rigidly ciliolate whitish entire margins, more or less scattered or clothed with whitish scales, $\frac{1}{4}$ to 1 in. long by $\frac{1}{16}$ to $\frac{1}{6}$ in. broad; flowers $\frac{1}{4}$ to $\frac{1}{3}$ in. long, opposite, sessile, solitary in the axils of the leaves and gradually arranged in terminal leafy erect spikes; bracts sublinear, nearly $\frac{1}{4}$ in. long at the base of the calyx; calyx $\frac{1}{4}$ in. long, campanulate, nearly regular, shortly 5-cleft; the lobes ovate-triangular, about half as long as the tube, obtuse; corolla not much exceeding the calyx; filaments a little hairy, not densely bearded; stigma large, curved; capsule oval-oblong, $\frac{3}{8}$ in. long.

Huilla.—In wooded grassy moist places between Ivantâla and Quilengues, sparingly; fl. and fr. March 1859. No. **5797**.

4. **M. hippocrepandrum** Hiern, sp. n.

An erect, branched, herbaceous-green, parasitical herb, 1 to 2 ft. high, not juicy; root tuberous, furnished with orange-cinnabar-coloured fibres; stem somewhat hispid, strictly erect, clothed below with small ovate sessile hispidulous or subglabrous green foliaceous scales and above with herbaceous green leaves; the latter opposite, subopposite, or alternate, more or less ovate and obtuse, paucidentate or nearly entire, narrowed and 3-nerved towards the shortly petiolate base, hispidulous, ranging up to 1 in. long by nearly $\frac{1}{2}$ in. broad; flowers in the upper axils solitary and gradually arranged in terminal spicate racemes; peduncles or pedicels short, the lower ones about $\frac{1}{6}$ in. long, the upper ones shorter; bracts 2, at the base of the calyx, linear-spathulate, $\frac{1}{8}$ in. long, shortly hispid; calyx broadly campanulate, $\frac{1}{5}$ to $\frac{1}{4}$ in., 5-cleft half-way down; the segments ovate-triangular, but little acuminate, beset with white hairs, ciliolate; corolla not much exceeding the calyx, deep yellow, 5-lobed; the tube dilated; the limb oblique, almost as in *Verbascum*; the lobes obovate-spathulate, obtuse, 3-nerved, imbricate in æstivation, rotately spreading in open flower; the nerves thick and strongly prominent on the lower face of the lobes; stamens 4, subdidynamous, inserted on the corolla-throat, alternating with its lobes, without any rudiment of a fifth stamen; filaments not bearded; anthers white, introrse, dorsifixed, longitudinally 2-celled, horseshoe-shaped, shortly pilose on the back; ovary globose, slightly trigonous; placenta central; style thick; stigma clavate, nodding, exceeding the stamens; seeds very numerous, delicate.

Golungo Alto.—Infesting crops of *Arachis*, too plentiful; fl. and fr. end of May 1856. In Sobato de Queta, on crops of maize and *Dolichos*, rather rare; fl. and fr. July 1855. No. **5900**.

This must be compared with *M. Vogelii* (Benth.), but it is less scabrid, and the calyx-lobes are not so obtuse. It is the parasite mentioned as a new genus in Welw. Apontam. p. 551, sub no. 101.

5. **M. orobanchoides** Engl. Pfl. Ost-Afr. C., p. 359 (1895).

Orobanche parviflora E. M. ex Drège, Cat. Pl. Exsicc. Afr. Austr. p. 4 (1837), and in Flora, 1843, Bes. Beig. p. 159. *Alectra orobanchoides* Benth., in DC. Prodr. x. p. 340 (1846). *Nigrina orobanchodes* O. Kuntze, Rev. Gen. Pl. iii. 2, p. 237 (1898).

Mossamedes.—A herb, about a foot high, parasitical on the roots of other plants; rhizome orange-fibrillose; stem simple, erect, purple; spike of flowers about 8 in. long; bracts and calyces herbaceous-green; corolla like yellow wine in colour, marked with purple nerves. In bushy places at the banks of the river Bero; fl. middle of July 1859. No. **5811**.

Huilla.—Plant about 10 in. high, twice branched, apparently parasitical, with the habit of an *Orobanche*; branches erect or nearly so. In bushy fields neglected after cultivation, near Mumpulla; fl. and fr. Oct. 1859. No. **5800**.

Both of these Nos. are represented by poor specimens, and the determinations are doubtful.

6. **M. atrosanguineum** Hiern, sp. n.

An annual, parasitical, terrestrial herb, about 7 in. high, root orange or atrosanguineous in colour; stem branched, glabrate and orange soon turning atrosanguineous in colour at the base, puberulous above; branches erect-patent; leaves few, small, almost bractiform, rather fleshy, atrosanguineous; flowers sessile, arranged in spikes terminating the stem and branches; spikes about 2 in. long, dense above, interrupted below, pedunculate, erect; bracts hispidulous, the lower ones oval sessile and about $\frac{1}{8}$ to $\frac{1}{6}$ in. long, the upper ones sublinear; calyx broadly campanulate, hispidulous outside, ciliolate, nearly glabrous inside, 10-nerved, atrosanguineous, shortly 5-cleft, about $\frac{1}{4}$ in. long; the teeth broadly ovate-triangular, apiculate; corolla sub-rotate, quite naked inside, scarcely exceeding the calyx, orange in colour; the tube short; limb 5-lobed; the lobes obtuse, somewhat spreading in open flower, nerved outside; stamens 4, without any rudiment of a fifth, inserted at the base of the corolla-tube, subequal, all fertile; anthers dorsifixed, almost horseshoe-shaped, 2-celled; filaments glabrous or (according to Welwitsch) pilose, not densely bearded; ovary green, globose, glabrous, 2-celled; ovules numerous in the cells; style firm; stigma long, curved, obtuse.

Pungo Andongo.—In secondary thickets between Sansamanda and Caghuy, very sparingly; fl. 1 May 1857. No. **5853**.

The following No. possibly belongs here:—

Pungo Andongo.—An erect herb, a foot and a half high, purplish throughout, apparently parasitical, simple, puberulous; leaves almost scale-like, lanceolate, dentate, scattered, $\frac{1}{3}$ to $\frac{1}{2}$ in. long; flowers spicate in bud. In bushy meadows at the river Cuanza, near Sansamanda; one specimen in young fl.-bud April 1857. No. **5890**.

7. **M. Welwitschii** Hiern, sp. n.

A parasitical herb, in form and mode of growth like an *Orobanche*; rhizome very thick, dusky outside, fleshy and yellowish inside; stems scape-like, scaly, nearly glabrous, leafless, numerous, simple or sparingly branched; 4 to 7 in. high, cylindrical, orange-purple at the base, purple-dusky towards the spike of flowers; scales small, ovate or oval, obtuse; calyx subequally 5-cleft, dusky-purple, about $\frac{1}{6}$ in. long; the lobes obtuse, ciliate; corolla orange in colour; segments of the limb 5, spathulate, somewhat concave at the apex, longitudinally striate outside with prominent

purple nerves, spreading at the time of the open flower; stamens 4, moderately curved; filaments densely bearded with long hairs; anther-cells distinct; ovary globose, style clavate, thick; stigma on a level with the stamens; capsule pyriform, with a furrow on each side; 2-celled, the cells many-seeded.

Mossamedes.—In sandy places at the river Bero near Cavalheiros, sparingly, at the roots of *Cotula* or similar plant; fl. and fr. 27 June 1859. No. **5812**.

8. **M. pictum** Hiern, sp. n.

An annual, parasitical herb, 4 to 12 in. high, scattered with short whitish hispid hairs, erect; rhizome with bright orange-coloured fibres; stem naked and bright orange-coloured at the base, hispidulous; branches erect-patent; leaves oblong or lanceolate, ranging up to $1\frac{1}{4}$ in. long by $\frac{1}{4}$ in. broad, the lower ones opposite, the upper and floral ones alternate, all subdentate, obtuse at the apex, wedge-shaped at the base, sessile or subsessile, herbaceous-green; flowers about $\frac{1}{3}$ in. long, subsessile, solitary in the axils and gradually arranged in terminal spikes; calyx broadly campanulate, about $\frac{1}{5}$ in. long, 5-cleft halfway down; the lobes broadly ovate-triangular, obtuse; the tube bibracteate at the base, the bracts chordiform, about $\frac{1}{12}$ to $\frac{1}{10}$ in. long; corolla campanulate, membranous, scarcely bilabiate, saffron-coloured; the 5 segments each marked with three reddish lines or nerves, subequal, rounded-obtuse, the lowest one a little larger than the rest; stamens 4, didynamous; the filaments shaggy from the middle to the apex; the anthers 2-celled; the cells unequal, bearded, attenuated upwards, the larger one embracing the smaller in a half-spiral; ovary 2-celled, the dissepiment placentiferous; style simple, nearly straight; stigma longer than the style, thickened, tongue-shaped, decurrent on both sides of the style, hooked-recurved; capsule subglobose, apiculate at the apex with the style or its remains.

Huilla.—In swampy pastures between Lopollo and the Monino, parasitical on the roots of Leguminosæ and Convolvulaceæ; fl. and fr. middle of May 1860. No. **5799**.

16. **GERARDIINA** Engl. Bot. Jahrb. xxiii. 507, t. x. fig. G—N.

1. **G. angolensis** Engl., *l.c.*

Gerardia sp., O. Kuntze, Rev. Gen. Pl. iii. 2, pp. 232, 234 (1898).

Huilla.—An erect or ascending bright green herb; roots stoloniferous; stems reddish; flowers purple-violet or violet-blue. By the Lopollo and Humpata streams, plentiful; fl. and fr. Dec. 1859 and April 1860. No. **5846**.

17. **MICRARGERIA** Benth.; Benth. & Hk. f. Gen. Pl. ii. 971.

1. **M. scopiformis** Eng. Pfl. Ost.-Afr., C., p. 359 (1895).

Gerardianella scopiformis Klotzsch in Peters, Mossamb. Bot. i. p. 229, t. 36 (1861).

Pungo Andongo.—An erect herb, 2 ft. high, branched like a broom; root apparently perennial. In marshy places near Quibanga, plentiful; fr. Jan. 1857. No. **5358**.

18. **VELVITSIA** Hiern, gen. nov.

Calyx gamosepalous, tubular-campanulate in flower, 5-cleft, inferior, accrescent; the teeth ovate, erect, equal among themselves, falling short of the corolla-limb. Corolla tubular, the tube inferior; the limb deeply 5-cleft; the lobes ovate, somewhat obtuse, imbricate in æstivation, soon erect-spreading. Stamens 4, inserted at the middle of the corolla-tube, subdidymous, all bearing anthers; the filaments somewhat thick, cylindrical-acuminate; the anthers 2-celled; the cells parallel, below free, narrowed, acute, not aristate, dehiscing longitudinally. Ovary free, sessile, oblong-ovoid, gradually narrowing at the apex into the cylindrical style, 2-celled; the placentas somewhat spongy; ovules very numerous, crowded, ascending; style terminal, curved in a hooked manner at the apex; stigma simple, somewhat thick, flattened, acuminate. Hypogynous disk annular, rather thick and fleshy. Capsule included in the erect bladdery persistent calyx, rigid, glabrous, 2-valved. Seeds numerous, elongate-cuneiform, crowned with a small round membranous appendage; testa very lax, sparingly verruculose; albumen apparently very thin; embryo straight; cotyledons tolerably large, subfoliaceous, plano-convex, twice as long as the terete radicle which is close to the umbilicus.

A perennial, erect herb, with the lower leaves opposite and trinerved, and the inflorescence terminal and racemose.

Named in honour of Dr. Welwitsch, whose notes have furnished the chief part of the description and were indispensable for that of the corolla and stamens, since our specimens have lost these organs. *Welwitschia* Reichenb. (1837) has been reduced to *Gilia* Ruiz & Pav. (1794), and *Welwitschia* Hook. f. (1862) must give way to the earlier name *Tumboa* Welw. (1861); there is also *Welwitschiella* O. Hoffm. (1894) in Compositæ.

1. **V. calycina** Hiern. sp. unica.

Plant 1½ to 2 ft. high, scabrid on most parts with short rigid hairs; rootstock woody, furnished with thick fibres; stems rigid, straight, angular, sparingly branched, with opposite leaves below and with some alternate leaves above and on the branches; leaves lanceolate or somewhat oval-oblong, obtuse or rounded at the apex, more or less narrowed to the subsessile or very shortly petiolate base, very rough, shortly hispid, bright green, rigidly membranous, densely venulose with raised venation between the nerves, narrowly revolute and remotely denticulate on the margin, exstipulate, 1½ to 3 in. long by ⅓ to ⅔ in. broad, the lower leaves smaller and crowded; petiole broad and very short or obsolete, somewhat hispidulous; inflorescence centripetal, narrow, 6 to 12 in. long; pedicels opposite, bracteate at the base, the lower ones ranging up to about an inch long, the upper ones shorter; bracts leaf-like, ¼ to 1¾ in. long; bracteoles at the apex of the pedicels, sublinear, ⅓ to ⅔ in. long; calyx about ½ in. long in flower, about ¾ in. long in fruit and then hemispherical, inflated, 10-nerved, not-veined, scabrid outside, smooth, with sub-deltoid pointed lobes; corolla whitish verging on pale yellow, marked

with violet-coloured veins; capsule loculicidal, about $\frac{1}{5}$ in. long, oval, pointed, somewhat compressed; style nearly $\frac{1}{2}$ in. long, glabrous; seeds $\frac{1}{16}$ in. long.

Huilla.—In moist thickets near Ohai towards Lopollo, at an elevation of 5000 ft., sparingly; fr. and a few fl. beginning of May 1860. No. **1263**.

19. **BOPUSIA** Presl, Bot. Bemerk. p. 91 (1844).

Graderia Benth. in DC. Prodr. x. p. 521 (1846); Benth. & Hook. f. Gen. Pl. ii. p. 970.

1. **B. scabra** Presl, *l.c.*

Gerardia scabra L. f. Suppl. Pl. p. 279 (1781). *Sopubia scabra* G. Don, Gen. Syst. iv. p. 560 (1837). *Melasma* (?) *Zeyheri* Hook. Ic. Pl. t. 255 (1840). *Graderia scabra* Benth., *l.c.*

Mossamedes.—A grey-green herb, 2 to scarcely 4 in. high, annual, parasitical at the roots of other plants; primary stem subterranean, bright orange in colour; basal branches opposite; leaves herbaceous-green, membranous; flowers yellow or wine-orange in colour, large enough in proportion to the size of the plant; corolla sub-campanulate, 5-cleft. In sandy moist and bushy places at the river Bero, very sparingly; fl. and fr. end of June and latter part of July 1859. A stunted form. No. **5809**.

20. **SOPUBIA** Hamilton; Benth. & Hook. f. Gen. Pl. ii. p. 970.

1. **S. decumbens** Hiern, sp. n.

A sparingly hispidulous, decumbent, suffruticose herb, woody at the base, 3 to 6 in. high; rootstock perennial, woody, throwing out long wiry fibres; stems numerous, much branched near the base, mostly decumbent; branches leafy below, ascending or erect, not scabrid; leaves linear and simple or with two lateral linear lobes, $\frac{1}{4}$ to $\frac{3}{4}$ in. long, opposite; pedicels nearly glabrous, somewhat spreading at least at the base, ranging up to $\frac{3}{4}$ in. long, the upper ones shorter, bibracteate above the middle; flower-buds $\frac{3}{8}$ in. long, obovoid; calyx $\frac{3}{16}$ in. long, 5-cleft, nearly glabrous outside except the densely ciliolate lobes; the lobes deltoid or rather narrower, pointed, $\frac{1}{12}$ in. long; corolla reddish purple, about $\frac{2}{3}$ in. in diameter when fully expanded, stamens 4, scarcely didynamous; anthers connivent, 2-celled, one cell very small; style long; capsule about $\frac{1}{3}$ in. long, scarcely as long as the persistent calyx.

Huilla.—In swampy bushy places near Lopollo; fl. and fr. Dec. 1859. No. **5839**.

2. **S. parviflora** Engl. Bot. Jahrb. xviii. p. 65 (1893).

Pungo Andongo.—At Sansamanda on the Cuanza; fl. and fr. April and May 1857. No. **5860**. At Lombe; fl. and fr. No. **5861**.

I have not seen the type of this species, and therefore the identification is doubtful, but the description agrees.

3. **S. filiformis** Hiern, sp. n.

An annual, erect, slender, scabrid herb, branched like a broom, 12 to 18 in. high; stem filiform; leaves filiform or linear, entire, scabrid, sessile, $\frac{3}{4}$ to 2 in. long; flowers axillary, arranged in

narrow erect spicate leafy or bracteate racemes terminating the stem and branches; pedicels ranging up to $\frac{1}{4}$ in. long, the upper ones shorter; flower-buds obovoid, $\frac{1}{3}$ in. long; in the young flower the calyx funnel-shaped, equally toothed, $\frac{1}{6}$ in. long; the teeth deltoid, acute, $\frac{1}{20}$ in. long; corolla whitish rosy, tubular; the throat dilated; the limb bilabiate, the upper lip bilobed, the lower lip trilobed, the tube naked within and purple-striate near the base; stamens 4, didynamous, included, inserted on the corolla-tube; filaments filiform, naked; anthers bilocular, the cells separate and diverging, the smaller one sub-effete, or quite sterile; ovary 2-celled; style filiform, attenuated; stigma somewhat club-shaped, incurved-nodding.

Huilla.—In damp pastures and swampy thickets, at an elevation of 5300 ft. in Morro de Monino; in flower-bud, 7 April 1860. No. **5830**. In damp meadows near Lopollo; fl.-bud middle of March 1860. No. **5831**.

4. **S. simplex** Hochst. in Flora xxvii. p. 27 (1844).

Raphidophyllum simplex Hochst., *l.c.*, xxiv. p. 667 (1841). *Gerdaria Dregeana* Presl, Bot. Bemerk. p. 91 (1844). *S. Dregeana* Benth. in DC. Prodr. x. p. 522 (1846).

Golungo Alto.—A herb, 1 to $2\frac{1}{2}$ ft. high; rootstock perennial, thick, almost tubercular, very hard; stems numerous, erect, green; leaves linear, adpressed to the stem, green; flowers rosy. In the drier and more elevated declivities among the mountains of Serra de Alto Queta; fl. and fr. at end of Aug. 1855. No. **5904**.

Ambaca.—An erect branched herb, apparently perennial; stem angular; leaves linear; flowers rosy, in shape resembling those of a *Verbascum*. In hilly rocky places between Izanga and N-gombe, rather rare; fl. and fr. Oct. 1856. No. **5912**.

Pungo Andongo.—At Cabinda in Mata Lucala; fl. and fr. No. **5852**.

Huilla.—Apparently annual; flowers purple. Among heath (cf. *Blœria setulosa*, Welw. no. 2558), on a declivity from Morro de Lopollo towards Humpata; fl. April 1860. Only one specimen, very doubtfully referred here; it has more acute calyx-lobes than the others. No. **5842**.

5. **S. ramosa** Hochst., *l.c.*, xxvii. p. 27 (1844).

Raphidophyllum ramosum Hochst., *l.c.*, xxiv. p. 668 (1841).

Cazengo.—A suffrutescent herb, 3 to 4 ft. high, erect, pyramidally branched at the top; flowers coppery purple as those of *Verbascum phœniceum* L. In dry bushy places, at the base of the Muxaula mountains, rather rare: fl. and young fr. June 1855. No. **5911**.

Pungo Andongo.—At Sansamanda; fl. and fr. 30 April 1857. No. **5864**. A herb, almost an undershrub, woody at the base with the wood whitish-straw coloured, 4 ft. high and more; rootstock tubercular-woody, biennial or triennial; stem erect, hard, branched from the middle to the apex; branches spreading, virgate, all ending in racemes of rosy-purplish flowers; placentas of an orange-brick-red colour as in *S. lanata*. In rocky thickets near Cabondo in the præsidium; fl. and fr. 3 May 1857. No. **5865**. Without fl. or fr. Dec. 1856. Apparently this species. No. **5866**.

6. **S. Welwitschii** Engl. Bot. Jahrb. xviii. p. 66 (1893).

Huilla.—In the more elevated muddy-rocky pastures, flooded in

summer, in Serra Oiakoya, plentiful; fl. and fr. Feb. March and April 1857. No. **5841**.

7. **S. cana** Harv. Thes. Cap. ii. p. 29, t. 146 (1864).

S. angolensis Engl. Bot. Jahrb. xviii. p. 67 (1893).

Huilla.—Flowers reddish purple or bluish purple. Among low bushes in pastures flooded in the rainy season, plentiful; fl. and fr. Jan. 1860. No. **5843**. Ivantâla; fl. and fr. Oct. 1859. The specimens stain paper a primrose-yellow colour. No. **5844**.

Our specimens differ from the type of Harvey's species by rather larger flowers, but some from the Transvaal, doubtless belonging to the species, have flowers of about the same size as ours.

8. **S. lanata** Engl. Bot. Jahrb. xviii. p. 67 (1893).

Pungo Andongo.—A perennial plant; stem densely leafy, straight. In damp bushy places at the banks of the Luxillo streams in declivities towards the river Cuanza; without fl. middle of Dec. 1856. No. **5857**. An erect, leafy, annual or biennial herb; stem about the middle branched like a broom; flowers rosy. In moist bushy pastures near Quibinda, plentiful, and very rarely in the rocky parts of the præsidium; fl. March, fl. and fr. April 1857. No. **5863**. In Pedras de Guinga, in fl. No. **5856**.

9. **S. argentea** Hiern, sp. n.

Suffruticescent, 9 to 18 in. high; rootstock perennial, woody, giving off long wiry fibres; stems several, erect or ascending, simple or branched chiefly near the base, woody and glabrescent below, herbaceous-wiry and silvery silky-tomentose above, leafy; leaves lanceolate or elliptical-linear, pointed at the apex, somewhat narrowed to the sessile base, more or less silvery silky-tomentose on both faces, entire, narrowly revolute on the lateral margins, crowded, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long; flowers axillary, shortly pedunculate; peduncles ranging up to $\frac{3}{8}$ in. long at least in fruit, bibracteolate at the apex; bracteoles rather more than $\frac{1}{4}$ in. long, like the leaves but linear and smaller; calyx nearly $\frac{1}{4}$ in. long, 5-cleft half-way down, silvery silky outside; the lobes triangular-lanceolate, acute; the tube glabrous inside; corolla about $\frac{1}{2}$ in. in diameter, membranous, glabrous, the limb very short; the limb rotate at the top of the calyx-tube; stamens 4, exserted, scarcely didynamous; anthers 2-celled, one cell very narrow; style exserted; capsule $\frac{1}{6}$ to $\frac{1}{5}$ in. long, scarcely equalling the persistent calyx.

Huilla.—In pastures at an elevation of 5000 to 6000 ft., by little forests of Proteaceæ, among the Serra de Neva mountains in Morro de Lopollo, rather plentiful; fl. and fr. April and May 1860. No. **5845**.

21. **STELLULARIA** Benth. in Hook. Ic. Pl. xiv. p. 12, t. 1318 (1880).

Benthamistella O. Kuntze, Rev. Gen. Pl. ii. p. 458 (1891).

Dr. Kuntze, *l.c.*, rejects Bentham's name on account of *Stellularia* L. Syst. Nat., edit. 6, ii. p. 106 (1748); this latter is, however, *Stellaria* L. (1753).

1. **S. nigrescens** Benth., *l.c.*

Benthamistella nigricans O. Kuntze, *l.c.*

Huilla.—An erect annual branched herb, with the habit of *Nemia* or even more like *Striga* ; stem pentagonal ; leaves opposite, linear-lanceolate, blackish green-purple above, herbaceous-green beneath ; flowers spicate ; calyx bibracteolate at the base, 4-dentate, the teeth long, acuminate, persistent ; corolla glossy yellow in prime flower, soon turning green, at length in drying black ; the tube rather long, curved from the middle up to the 5-cleft limb ; the lobes linear, somewhat fleshy, rather thick, spreading, four of them more or less approximated ; the floral bract embracing the flower at the base, broadly ovate, keeled ; the bracteoles linear ; capsule 2-valved, cylindrical-oblong ; the valves in the apparently immature capsules bifid at the apex ; seeds numerous. In a bushy moist pasture near Catumba, plentiful but seen only in one locality ; fl. and fr. April 1860. No **5838**. An annual erect herb, green in the living state, at length turning black ; flowers at first purple, at length greenish, black when dry In herbaceous thickets at the Monino ; fl. beginning of April 1860. No. **5837**.

22. **BUCHNERA** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 968.

1. **B. Henriquesii** Engl. Bot. Jahrb. xviii. p. 69 (1893).

Huilla.—A perennial herb ; root woody ; stems numerous ; leaves bright herbaceous-green ; flowers of a very beautiful and very bright violet colour, bearing a resemblance to some verbenas. In hilly sunny places on a sandy clay soil, near Lopollo, rather rare ; fl. Nov. 1859. No. **5833**.

2. **B. pallescens** Engl., *l.c.*, xxiii. p. 512 (1897).

Mossamedes.—An annual, slender, erect herb, herbaceous-green, with deep blue flowers. In sandy thickets about the river Bero, very rare ; fl. beginning of July 1859. No. **5825**. Flowers blue. In sandy places among low bushes at the banks of the river Maiombo ; fl. and fr. Oct. 1859. No. **5826**.

This species bears some resemblance to *B. Henriquesii*, and should be compared with it ; the inflorescence, however, is more elongated and laxer.

3. **B. ciliolata** Engl., *l.c.*, xviii. p. 69 (1893).

Huilla.—A very elegant, annual herblet, scarcely a span high ; stem slender, branched from the base or nearly simple ; branches spreading-ascending, filiform ; leaves opposite, linear ; flowers deep violet purple, tolerably large for the habit of the plant ; corolla remarkable for the long broadly linear quite flat lobes of the sub-bilabiate deeply 5-cleft limb, the lobes deeply emarginate at the apex, the 2 upper ones a little shorter than the rest ; stamens 4, didynamous, with reflected anthers. In somewhat spongy pastures flooded by the summer rains and then in company with *Utricularia*, on the Humpata plateau ; fl. beginning of April 1860. No. **5823**.

4. **B. andongensis** Hiern, sp. n.

An erect annual herb, branched from the base, more than 8 in. high, dusky in the dry state ; branches obtusely tetragonal, hispidulous-scabrid ; some of the upper internodes exceeding the leaves ; leaves mostly opposite, obovate-oblong, obtuse or sub-apiculate at the apex, wedge-shaped at the sessile or subsessile base, trinerved, entire or obsoletely denticulate, herbaceous-green, membranous, scabrid, $\frac{2}{3}$ to 3 in. long by $\frac{1}{4}$ to 1 in. broad ; flowers whitish, $\frac{1}{4}$ to $\frac{1}{3}$ in. long, sessile or subsessile, many together,

arranged in sessile terminal semi-ellipsoidal bracteate heads which are $\frac{1}{2}$ to $\frac{2}{3}$ in. long and together form terminal corymbs; bracts about equalling the calyx, oblong or ovate, glabrous inside, ciliate, somewhat hispid on the back, the hairs whitish; bracteoles narrower, about equalling the calyx or its tube, ciliate; calyx $\frac{1}{5}$ to $\frac{1}{4}$ in. long or rather more, shortly 5-lobed; the tube glabrous inside, ribbed or angled outside, some of the ribs or angles ciliate; the teeth lanceolate or ovate-lanceolate, ciliate, somewhat unequal; corolla tubular, the tube rather slender, straight or somewhat curved near the apex, as long as the calyx; the limb rather small, 5-lobed; stamens 4, didynamous, inserted about the middle of the corolla-tube, glabrous; filaments short; anthers narrowly lanceolate, acute, rather small; pistil about $\frac{1}{3}$ in. long, glabrous, included; style $\frac{1}{16}$ in. long, not very slender; stigma rather small; capsule $\frac{1}{6}$ in. long, glabrous, 2-celled; seeds numerous.

Pungo Andongo.—In the forest between Cazella and Zambe, only one specimen; fl. and fr. 7 June 1857. No. **5850**.

5. **B. ensifolia** Engl., *l.c.*, xxiii. p. 511 (1897).

Var. **andongensis** Engl., *l.c.*, p. 512.

Pungo Andongo.—A slender, annual, erect herb, in habit resembling some *Striga*; the whole plant quickly turning black in drying; stem undivided below, oppositely branched above, pilose with short hairs; leaves linear, sub-erect, bright green, shortly pilose; flowers blue. In rocky pastures on the highest mountains of the præsidium; fl. and young fr. May 1857. No. **5882**.

6. **B. Welwitschii** Engl., *l.c.*, xviii. p. 70 (1893).

Pungo Andongo.—An annual erect herb, turning bluish black in drying; flowers blue. In moist meadows and sandy thickets near Lombe and Condo; fl. and fr. March 1857. No. **5847**. At Calunda Mangue; fl. and fr. No. **5859**.

Huilla.—An annual erect slender herb, simple or very rarely branched; radical leaves rosulate; corolla deep blue, the limb 5-cleft, the two upper lobes a little shorter than the rest, all flat and obtuse. In moist sandy places on the Humpata plateau; fl. April 1860 No. **5832**.

Var. **elata**.

An erect annual herb 2 to 3 ft. high; stem simple and leafy below; the lower leaves oblong, remotely toothed, very scabrid, about 2 in. long by $\frac{1}{2}$ in. broad; inflorescence less densely hairy than in the type; flowers pale blue.

Mossamedes.—In sandy places at the river Maimbo; rather rare; fl. Oct. 1859. No. **5827**.

7. **B. angolensis** Engl., *l.c.*

Huilla.—An annual erect slender herb, 4 to 12 in. high, branched from the base, the whole plant turning black in drying; stem and branches tetragonal; leaves bright green; flowers arranged in tetragonal species; corolla violet-blue, the tube rather long, the limb 5-cleft. In elevated pastures on the Humpata plateau, near Empalanca; fl. April 1860. No. **5829**.

8. **B. trinervia** Engl., *l.c.*, xxiii. p. 512 (1897).

Pungo Andongo.—No notes. In fl. and fr. No. **5833**. An erect, annual green herb, somewhat resembling a *Lavandula* in habit, 2 to 3 ft. high or more ; flowers blue, scentless, as is the whole plant. In sandy thickets between Luxillo and Cazella, very rare ; fl. Jan. 1857. No. **5885**. Leaves linear, opposite ; flowers arranged in dense quadrangular spikes. In moist meadows at the river Cuanza; fr. May 1857. Coll. Carp. 808.

9. **B. humpatensis** Hiern, sp. n.

An annual, erect, branched, rather slender herb, 9 to 12 in. high, dusky in the dry state, glabrous throughout except small callous scales scattered over some parts; stem angular, usually bright purple-red ; branches opposite or the upper ones alternate, ascending, the flowering ones virgate ; leaves opposite or the upper ones alternate, mostly purplish, lanceolate or sublinear, obtuse or somewhat pointed at the apex, somewhat narrowed to the sessile base, ranging up to $1\frac{1}{2}$ in. long by $\frac{1}{5}$ in. broad, the lowest ones small, nearly glabrous, sub-entire, the margins minutely crenulate-undulate with cartilaginous-callous scales or teeth and very narrowly revolute ; flowers about $\frac{1}{6}$ to $\frac{1}{5}$ in. long, subsessile, arranged mostly in pairs or nearly so, arranged in interrupted pedunculate spikes of 2 to 6 in. in length terminating the stem and branches; bracts broadly ovate, obtuse, concave, adpressed to the calyx $\frac{1}{8}$ to $\frac{1}{4}$ in. long, glabrous or nearly so; calyx $\frac{1}{8}$ to $\frac{1}{6}$ in. long, slightly mealy-puberulous, tubular, shortly 5-toothed ; the tube campanulate-oblong, somewhat costate-angular ; the teeth more or less triangular, pointed, somewhat unequal, much shorter than the tube ; corolla tubular, the tube green, scarcely curved, but little inflated at the base, about as long as the calyx ; the limb rather small, 5-cleft, subbilabiate, the segments flat; stamens 4, didynamous, inserted about the middle of the corolla-tube, all fertile ; ovary 2-celled ; style short ; stigma sub-bilobed, with one lobe nearly obsolete ; capsule coriaceous, 2-celled, 2-valved, about $\frac{1}{6}$ in. long, the valves entire or sometimes emarginate ; seeds numerous.

Huilla.—In the damp pastures of Humpata and Nene, among short grass ; fl. and fr. 19 April 1859. No. **5798**.

Nearly related to *B. mossambicensis* Kl., but the inflorescence is more interrupted and the flowers smaller.

The following No. is probably a new species of *Buchnera* allied to *B. dura* Benth. :—

Pungo Andongo.—No notes. In late fl. Plant 18 in. high, once trichotomous. The leaves are narrowed towards the tip and the calyx teeth are sub-deltoid. No. **5836**.

23. **CYCNIUM** E. Mey. ; Benth. & Hook. f. Gen. Pl. ii. p. 969.

1. **C. adonense** E. Mey. ex Benth. in Hook. Comp. Bot. Mag. i. p. 368 (1836).

Pungo Andongo.—A low, densely cæspitose herb ; root perennial, woody ; stems numerous, prostrate, ascending ; corolla salvershaped, at first white, soon turning clear blue, at length violet-livid. In the

course of drying the stems and leaves also become tinged with a livid bluish colour. In sandy wooded places near Cazella, seen nowhere else in the district; fl. 18 Oct. 1856. No. **5868**.

Huilla.—A perennial herb; stems several; leaves herbaceous-green; flowers milk-white, soon turning a livid-violet colour, at length when dry blackish. In pastures among low bushes near Lopollo, very rare, fl. Feb. 1860. A handsome form with leaves ranging up to 3¼ in. by 1½ in. broad and flowers up to 4 in. long. No. **5779**.

24. **RHAMPHICARPA** Benth.; Benth. & Hk. f. Gen. Pl. ii. 969.

1. **R. fistulosa** Benth. in DC. Prodr. x. p. 504 (1846).

R. longiflora Benth. in Hook. Comp. Bot. Mag. i. p. 368 (1836), partly; not in DC., *l.c.* *Macrosiphon fistulosus* and *M. elongatus* Hochst. in Flora, xxiv. p. 374 (1841).

Pungo Andongo.—An annual herb, 1 to 2 ft. high, at first erect, afterwards especially when in fruit decumbent or ascending, in the living state yellowish-green, quickly turning black in drying; flowers whitish-rosy. In swampy places among Cyperaceæ, at the banks of the river Cuanza, near Cavallo, plentiful; fl. and fr. 31 Jan. 1857. No. **5889**. In Mata Lucala; fl. and fr. No. **5889***b*. Without fl. or fr. Dec. 1896. No. **5862**.

2. **R. angolensis** Engl. Bot. Jahrb. xviii. p. 74 (1893).

Huilla.—An annual erect asperulous herb, 2 to 3 ft. high, branched above; stem obtusely tetragonal, mostly purple; leaves strictly and everywhere opposite, bipinnately laciniate, all the segments linear and as well as the stem and calyces beset with hyaline somewhat rigid and glandular hairs; flowers bibracteolate; calyx elongate-campanulate, herbaceous-green; the 5 teeth elongated, spreading, linear, persistent; corolla milk-white, rosy at the throat and in the tube, the whole soon turning bluish, at length blackish, almost salvershaped; its tube slender, much longer than the calyx, gibbous in the middle on the upper side in consequence of the turgidity of the anthers; the limb 5-cleft, bilabiate; the lobes obovate, the 2 upper ones ascending and a little shorter than the 3 lower ones which are a little larger and spread downwards or stretched forwards as in some species of *Mimulus*; stamens 4, inserted on the corolla-tube a little above its base, included, but little didynamous; filaments bearded; anthers unilocular with an evident tendency to the formation of a septum; style quite simple, subfiliform, but little thickened in the middle, subulate at the apex and there very delicately papillose-stigmatose; young capsule obliquely horned, bilocular; placentas united; young seeds like sawdust in shape. On a clay soil in bushy places and thickets sprung up after neglected cultivation, on the right bank of the Lopollo river, rather rare; fl. at the end of March, fr. at the beginning of May 1860. No. **5780**.

25. **STRIGA** Lour.; Benth. & Hook. f. Gen. Pl. ii. p. 968.

1. **S. orobanchioides** Benth. in Hook. Comp. Bot. Mag. i. p. 361, t. 19 (1836).

Büchnera gesnerioides Willd. Sp. Pl. iii. p. 338 (1800). *Lathræa gesnerioides* König ex Willd., *l.c.* *B. orobanchoides* Br. in Salt, Abyss., App. p. lxiv (1814). *S. gesnerioides* Vatke in Oesterr. Bot. Zeitschr. xxv. p. 11 (1875).

Loanda.—A herb, bright green in the living state, even the ovaries and capsules herbaceous-green and as also the stem and scales varnished-glossy : flowers violet in colour, open nearly throughout the year ; in moist sandy places, parasitical at the roots of *Shutereia bicolor* Choisy (Welw. Coll. Carp. 761), about Loanda, as for instance at Represa de Luiz Gomes ; fl. and fr. Dec. 1853 and April 1854. Primary stem usually twisted and deformed, the other stems strictly erect, 6 to 12 in. high, as well as the ovate-acuminate scale-like leaves pale green quickly turning black ; branchlets quite erect, adpressed to the stems, floribund as well as the stems ; floral leaves bract-like, scarcely reaching half-way up the calyx ; flowers almost always violet, very rarely white, never seen otherwise coloured ; calyx-ribs thick, raised ; the 2 lateral bracteoles lanceolate ; in rather damp sandy somewhat muddy depressions where rain-water ponds, from Loanda towards Quicuxe, plentiful ; fl. and young fr. 7 Feb. 1859. No. **5916**.

Pungo Andongo.—An annual, green herb, the whole plant turning black in drying ; flowers lilac. In damp bushy places at the river Luxillo ; fl. and fr. Jan. 1857. No. **5848**.

Mossamedes.—A dusky red herb with pale bluish flowers. In sandy bushy places at the banks of the river Bero, near Cavalheiros, sparingly ; fl. and fr. July 1859. No. **5824**.

2. **S. Thunbergii** Benth. in Hook., *l.c.*, p. 363.

Buchnera asiatica L. Sp. Pl., edit. 1, p. 630 (1753) partly. *B. bilabiata* Thunb. Prodr. Pl. Cap. p. 100 (1800).

Pungo Andongo.—A somewhat fleshy herb, green in the living state ; flowers very bright violet in colour. In moist pastures near Condo ; fl. and fr. March 1857. No. **5854**.

Huilla.—Flowers red-purple. In the damp meadows of the Monino, in company with species of Primulaceæ and *Burmannia bicolor* Mart. var. *africana* Ridl. (Welw. Herb. No. 6473) ; fl. and fr. Dec. 1859 and Jan. 1860. No. **5822**.

3. **S. canescens** Engl. Pfl. Ost-Afr., C, p. 361 (1895).

Huilla.—An annual herb ; root subsimple ; stems few, very slender, erect ; leaves opposite, lanceolate-linear, subulate ; adpressed closely to the stem ; flowers pale lilac. In little woods of Proteaceæ, among herbs, at the river Monino, sparingly ; fl. end of Nov. 1859. No. **5823**.

In our specimens the lobes of the anterior lip of the corolla are ovate-oblong rather than lanceolate, and the plants are less hoary than in the type.

4. **S. Welwitschii** Engl. in Bot. Jahrb. xxiii. 514, t. xii. fig. F, G.

Huilla.—An annual, parasitical, pilose-viscid, canescent herblet, in habit somewhat resembling a species of thyme ; stem erect, sparingly branched towards the apex ; flowers pale lilac. In thickets on a sandy clay soil, about Lopollo, rather rare ; fl. and fr. Dec. 1859. No. **5820**. Flowers whitish ; in sandy thickets on the right bank of the Lopollo river ; fl. and fr. Jan. 1860. Flowers white ; in hilly bushy sandy places among short grasses, between the Ivantâla lake and Quilengues ; fl. and fr. Feb. 1860. No. **5821**.

5. **S. elegans** Benth. in Hook., *l.c.*, p. 363.

Pungo Andongo.—A green parasitical herb, with splendid scarlet flowers. In moist meadows near Sobato N-billa ; fl. and fr. March 1857. No. **5851**.

6. **S. lutea** Lour. Fl. Cochinch. p. 22 (1790).

S. coccinea Benth. in Hook., *l.c.*, p. 364. *S. hirsuta* Benth. in DC. Prodr. x. p. 502 (1846).

Pungo Andongo.—An erect annual rather scabrid herblet, 2½ to 7½ in. high; leaves linear; flowers very brilliantly cinnabar-red; calyx 10-striate; corolla-tube curved above the middle. Sub-parasitical in damp pastures on a rich soil to the south-west of the præsidium, on the right bank of the river Cuanza; fl. and fr. 4 Jan. 1857. No. **5881**. Flowers very bright scarlet. In sandy wooded places between Luxillo and Cazella; fl. Jan. 1857. No. **5880**.

Huilla.—Flowers very bright scarlet. In pastures among low bushes and in the neighbouring wooded meadows, between Lopollo and Jâu; fl. Dec. 1859 and Feb. to April 1860. No. **5819**.

7. **S. Forbesii** Benth. in Hook., *l.c.*, p. 364.

Pungo Andongo.—At Lombe, fr. No. **5893**.

8. **S. macrantha** Benth. in DC., *l.c.*, p. 503.

Buchnera macrantha Benth. in Hook., *l.c.*, p. 366. *B. Büttneri* Engl., *l.c.*, xviii. p. 72 (1893).

Golungo Alto.—An annual herb, with the habit of a *Rhinanthus*, strictly erect; flowers white; corolla-tube incurved at the apex almost at a right angle; the limb 4-cleft, with rounded lobes; capsule 2-celled, many-seeded. On sparingly grassy slopes among the mountains of Alto Queta; fl. and fr. April 1856. No. **5907**. Spikes of flowers thick, prismatic. On the declivities of the Quilombo mountains, sporadic; fr. July 1856. Coll. Carp. 806.

26. **HARVEYA** Hook.; Benth. & Hook. f. Gen. Pl. ii. p. 967.

1. **H. andongensis** Hiern, sp. n.

A herb, about 14 in. high; stem erect, rather slender, weak, scaly at the base, nearly leafless at least on the lower half; upper leaves few, narrowly elliptical, acute, glandular-pubescent, sessile, ⅖ to ⅔ in. long, suberect, alternate or subopposite; inflorescence lax; flowers about 3, terminal and subterminal, 1½ to 2 in. long, somewhat drooping, blood-red; peduncles ¾ to 1½ in. long, suberect, pubescent with short spreading glandular hairs; calyx campanulate-tubular, ⅔ to ¾ in. long; the tube ½ to ⅔ in. long by ¼ in. broad, puberulous or nearly glabrous; the lobes 5, deltoid-ovate, glandular-ciliolate, about ⅙ in. long; corolla-tube deep yellow and puberulous outside, narrowly tubular and ⅛ in. broad in the lower half, funnel-shaped and widened upwards, more or less curved; the limb spreading, 1½ to 1¾ in. in diameter, 5-partite, membranous, glabrous; the segments rounded, veiny; anthers included, placed about the middle of the corolla-tube; style curved and glandular-puberulous about the shortly exserted apex; stigma subglobose.

Pungo Andongo.—In secondary Panda forests between Quibinde and Quitage; one specimen, fl. beginning of March 1857. No. **5867**.

Differs from *H. capensis* by longer peduncles, etc.

2. **H. huillensis** Hiern, sp. n.

A glandular-shaggy, simple, erect herb, about 5 in. high,

apparently parasitical; leaves opposite, oval-oblong or narrowly obovate, obtuse at the apex, narrowed towards the sessile base, herbaceous, $\frac{2}{3}$ to 1 in. long, about $\frac{1}{4}$ in. broad, the lower ones smaller and squamiform; flowers solitary in the upper axils, spreading, about $1\frac{1}{2}$ in. long; peduncles about $\frac{1}{6}$ in. long; calyx nearly an inch long, about $\frac{1}{4}$ in. broad, tubular, somewhat inflated or at least very loosely surrounding the middle of the corolla-tube; the lobes 5, subequal, ovate-lanceolate, $\frac{1}{5}$ to $\frac{1}{4}$ in. long; corolla sub-bilabiate, glandular puberulous outside, the tube narrowly tubular below where included in the calyx-tube, inflated somewhat ventricose and yellow above where exserted; the limb about $\frac{3}{4}$ in. in diameter, blue; with obovate segments which are about $\frac{1}{2}$ in. long; style curved near the apex, about equalling the corolla-tube; stigma broadly obovoid.

Huilla.—In Panda forests between Bordo da Terra and the Ivantila lake, one specimen; fl. 28 Feb. 1860. No. 5840.

Differs from *H. scarlatina* Hook. by shorter calyx, etc.

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June 1st, 1896.